Mining Investments and How to Judge them

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Mining Investments and How to Judge Them

By

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PREFACE

In preparing a preface to this, a third edition of "Mining Investments and How to Judge Them," I wish first to extend sincere thanks to the kind readers who have thought well of my efforts and have made a third edition possible. I desire especially to thank the eminent educators who have done me the honor of using my book in their technical classes, their lectures and their recommendations for courses of reading in regard to mining.

We are now passing through a transition period in mining affairs, with a tendency to severe criticism which has in many instances gone beyond reasonable justice. It seems to me that we expect too much of mining, but mining stocks are so frequently put forward as investments, when the word speculation, or venture, would be more fitting, that expectations are raised which are rarely fulfilled. As a usual thing mining cannot come up to the standard of an investment, and too frequently brings only disappointment to those

who judge mining ventures by investment standards. Such disappointments would not occur if mining were held more to its true position. Still mining investments are constantly being discussed, and if the public will persist in so considering them it becomes a duty to know how, and by what standards, they may be judged. For this purpose my book was written and has now been carefully revised for its third edition.

The Author

I

The Organization and Financial Development of a Mining Company

If one who casually buys a mining stock, believing, so he says, that he is "stuck," yet hoping that the reports may prove true, could know all the struggle, pathos, hopes, despair and moments of triumph attending the effort for the financial development of a mining enterprise; one would sympathize with the promoter, and wonder at the determination, which, if success is to be obtained, must meet and overcome prejudices, must encounter doubts, and incredulous disbelief during years of effort to find success in beating down all barriers, and obtaining the necessary capital to operate the mine. One who is strong enough to obtain his end against such opposition is calculated to succeed, and usually does make a success of his mine after obtaining the money to operate it. There is pathos and sorrow in the effort because all do not succeed, even though a life time is dedicated to the effort. One instance comes to my memory. A miner prospecting

some years ago discovered a mine, and thought it a good one; obtained the title and set to work to raise the money for its equipment, but without success. The mine was in Central America, a place not too well esteemed, and few would listen to his story. Yet he labored on, he and his wife together. Sometimes they made a little money at one work or another, and then would spend it looking for someone who would hear their story, and advance the capital required to work the mine. Time went by, they grew old together and died in want, and the mine was never worked. What pathos of hopes and disappointments were hidden in these wasted lives none knew, nor is this an isolated example. Many are waiting, working and hoping today; some will succeed, others are doomed to disappointment; but they will struggle on, for the mining spirit, like the gambling fever, is hard to subdue; and it is all so plain to those who own the mines, and feel sure as to their worth, that it seems impossible that someone will not harken, and take a venture with them, where they themselves have risked their all; and yet how little encouragement is found. If this were different, and if people who had money to invest gave better heed to those who actually own a mine, and sought for capital to estab-

lish works which they would themselves operate, the story of mining would be very different and many permanent successes would be chronicled each year; but people doubt the miner, who with blunt story and rough ways seeks for financial help, and asks for partners to share in his venture. So the mining company and its financial development comes on the scene. The mine owner, weary in his search, receives offers that a promoter, banker, broker, or other personage will take up his proposition, provided suitable terms are arranged. I remember well how one old prospector replied to such a proposition. "She's a good prospect, but she ain't worth no million dollars; may be when she's opened up, but that's not now." "Precisely," the promoter said; "we capitalize the prospective, not the present worth and then sell shares based on the present worth at low prices which advance as values are developed; those who put their money out for development thus reap the benefit, and this is what I propose." "Each person who invests at prospect prices in a capitalization for prospective worth knows that if our expectations are brought to realization his profit will be in holding a great number of our shares." So the prospect was capitalized for $1,000,000.

This was the first step in the financial development of the mine. When a proposition is put forward on this basis and is honestly managed, the proposition is fair, but unfortunately the offering is not always justly managed and a greater value is placed on the present worth than conditions warrant; and here is the first influence which makes for loss in mining stocks. Capitalization for prospective worth, but the price representing the present worth, the money asked for the shares, is often more than actual present worth will warrant.

If a prospect is worth $10,000 and the company owning the prospect is capitalized for $1,000,000 then the present actual worth of shares is 1%; and if, as usual, the par value of the shares is $1.00 then the actual worth is just one cent a share, and on such a basis, and at such a price would be well worth buying; but this investment would be in nothing more than a prospect, and except the shareholders or partners, for such they really are, spend something on the mine to open it for operation; and then provide machinery to treat the ore, it will remain a prospect worth just one cent a share and nothing more. This is not good business, and one goes at hazard in a mine to make a profit, not to hoard money, so funds must be provided to operate and work; and this brings

forward the next step in the financial development of a mining company.

The miner being asked as to the division of the shares naturally replies that being partners he and the promoter should divide, but this is not a satisfactory basis for those proposing to promote the scheme: explanation is made that in order to raise money shares must be sold, and that some must be donated to the treasury for purposes of development; so after much discussion it is generally agreed that of the shares, one-third shall go to the owner, the promoters take a third, and one-third is placed in the treasury; the old miner, doubtful as to what he had done takes his paper, yields his titles to the company, and goes back to the mine; the promoters undertaking to produce funds by selling treasury stock to keep him at work.

This is now the situation, a prospect worth in cash $10,000 has been capitalized at $1,000,000, and one-third of the shares must provide all the money for operation and development. In ordinary business a person contributing the total capital might be contented with one-third the profits, but would probably ask more and would control whatever property the business owned. In mining similar arrangements should be made, and they who contribute capi-

tal should not only be preferred in shares and dividends, but should be given actual liens upon the property to make their preferences secure. This is not often done because it is of little advantage to promoters, and the offerings are of shares alone, usually appearing with glowing prospects, and the statement that so many shares are in the treasury to be sold at a low price, probably twenty-five cents a share. Frequently the announcement is made with great show of virtue that no officer receives compensation for his work, a suspicious circumstance, because men cannot afford to work for nothing, and do not work for nothing even in a mine. It is a better proposition when those who promote state exactly what they have as profit, and better yet when a mining company pays its officials and obtains men competent to do successfully the work required of them.

There seems a tendency among mining promoters to pose as philanthropists, who work for nothing, and with the mining proposition under discussion the usual offerings appear; the miner has gone back to his mine now incorporated, and obedient to instructions writes glowing letters, his own enthusiasm developing more and more. What he writes is quoted, and the shares begin to sell, not very freely, because they never do; and the pro-

moters, in order that sales might be made in greater volume, offer large commissions, incur expenses and offer special terms, so that in the end often not more than one-third of the money realized for shares goes to operate the mine; and this small proportion has to do the work in which all the great number of shares have equal participation. If of the treasury shares one-third are sold at twenty-five cents each, and one-third the money realized is put to actual work in mine, then the money so placed would represent about two and eight-tenths per cent. of the capitalization; this, with the one per cent. which the prospect was actually worth at the beginning makes an aggregate of three and eight-tenths per cent. actual value, real money, in the proposition, and this small percentage must earn dividends for the total capitalization. So if the old miner is not mistaken in his mine, and it does yield shipping ore from which a profit can be made, the mine must return in profits nearly 200% each year on the money actually in the proposition in order to pay 6% on the capitalization. There are many propositions which do as well as this, but the rocks of disaster are never very far away; funds are apt to run low, leaving the enterprise not wrecked but stranded; and another is

added to the long list of mines owned by corporations, but not in operation.

The promoters were eager for very great profits, if the mine had paid, as they anticipated from the very start, all would have been well; but the financial development of the proposition not being on a secure foundation, nothing was provided for contingencies, and troubles appearing, the burden of the capitalization was too great. This is the history of most mining enterprises, though some succeed, even at this great disadvantage, and if better provision were made, the number of successes would be in favorable comparison.

These are the usual conditions of most mining propositions though not all; many are well organized, and the investor should learn to select those which are organized on proper lines, and to show what these lines of proper organization may be is the object of the following chapters.

It does not cost much to put forward a mining proposition, and where expenses of promotion are deducted from the treasury stock the promoters take but little risk; a risk which may not exceed the figures in the following calculation of expenses for bringing out a mining proposition at one million dollars capitalization.

Calculation of minimum expenses in bringing out a mining stock.

Charter, in one of the cheaper states..	$25.00
Stock book, ledger and seal.....	10.00
Printing the prospectus, 1,000 copies..	25.00
Advertising at $25.00 per week for one month	100.00
Postage and office rent (frequently desk room)	25.00
Total.....	$200.00

One month's expenses, after which it is expected that money will be coming in. If the stock sells the promoters make a big profit, and the mine is operated; if the stock does not sell the loss to the promoters is not great and they can try again with some new proposition.

With such excellent prospects for a profit, with mine owners grown weary looking for partners to do actual mining, with mines and prospects to be had for shares in the companies incorporated to take them over, it is little wonder that mining promoters are many; yet mining pays such splendid returns that even with the great disadvantages attending the American system of company promotions, among the many who buy mining stocks thousands

make handsome returns, and win fortunes out of such investments; and the desirable position for an investor is to learn how to discriminate and select the good from the bad; because there are desirable mining propositions brought forward constantly, and money is to be made if only one uses good judgment in selecting.

These statements are not idle words. It is a too frequent occurrence in the financial development of a mining company that of the money subscribed an adequate proportion does not go into the property, and the shares sold for cash are far in the minority, a basis not calculated to be of advantage to those who invest; and one should look well to this point before purchasing. It is like having too many partners who have not contributed any cash to the business, and if such a proposition is offered the investor should demand that the mine be pledged as security for the money actually contributed.

When it is found that a proposition is not over-burdened with promoters' shares in its financial development, or that those who are promoting the enterprise are giving full value for what they reserve for themselves in shares, then the financial proposition is on a fair basis and can so far be considered favorably.

II

The Organization and Physical Development of a Mine

It takes money to work a mine, it takes money for the equipment; but those who manage a mine, and yet are not accustomed to the business think that no impediment stands against the easy money they expect to win. Take out the ore and remit the proceeds, write the directors; this is the sense of the meeting, and the puzzled miner looks at his instructions and sends some practical suggestions as to the best methods for opening up the mine, and the machinery which will probably be required. The directors hold a meeting and generally resolve with great show of wisdom to send machinery without delay, effort is made to raise more money through the sale of stock, or if money is in the treasury it is at once appropriated; people who have machinery to sell are called in consultation; and the next thing an equipment is sent out to the puzzled miner, and word goes too that it must be placed in position, without delay, and returns sent in. It

is returns, money coming in, that the directors want to see; the stockholders expect dividends, hurried calls are sent to the manager; but all in vain, such is not the way to operate a mine, failure almost certainly comes to oppress, and once a mining company has failed there is poor chance of re-establishing the enterprise. That disaster follows too hasty effort at results is because, before the character of the ore is known, before its proper treatment has been ascertained, and often times before the mine is even opened, machinery has been bought and shipped; the directors expecting it will fit requirements, and hazarding the money on a guess are generally obliged to meet, and to explain the disappointments; because machinery bought in this haphazard way can hardly be expected to give good results.

An incident of such work as this can be found in numerous mines. One which has for some years past been prominently before the public is a good example. It was a prospect, and as such had merit, but neither the character of the ore, the amounts to be obtained or the physical requirements had been well established; yet beneath the magic touch of capital great undertakings were commenced, men swarmed about the property, shafts were sunk, electric plants gave light in all the galleries

under ground, mills were in process of erection, houses, railway sidings, everything which engineering, directed by those who had machinery to sell, could devise was being done; and after thousands had been spent it developed that the machinery was not suited to the ore, then other plans were tried; new equipment recommended by those who had machinery to sell was purchased. Three times were failures the sole reward for thousands spent, and the mine was brought to such an ill repute that where a good result might easily have been attained, were debts, a property involved, machinery of little use; and all just struggling to be maintained. Then one of the directors, prominent in business life, admitted that he was a fool, that is, when it came to mining propositions; and so he was, and so are most men who, as directors of mining enterprises, force the issue, seek quick returns and vote to build and establish equipment before the mine is opened. Luck may be with them, and by chance the equipment may be suited to the requirements of the ore, but usually luck leads a man astray, and when an investor hears of rapid work of equipment and development going hand in hand, it will be safe to let such propositions go to others; for where good mining practice is not well maintained the chances

of success are very poor. Naturally one may inquire, what is good mining practice? This question does not admit of easy answer, for no two mines are found the same, and what is good practice in one would probably lead to disaster in another. Yet certain general principles can be considered as bearing on the question, and these being understood the enquirer can form an opinion as to whether the organization and physical development of the mine is proceeding as it should.

Mines may be divided into three classes.

First, those which produce ores very high in value, with every ounce of ore worth careful handling.

Second, those yielding rich ores and by their indications promising supplies of mineral which can be milled to certain profit.

Third, mines which yield a low grade of ore from which a profit can be had, if the product can be treated to advantage.

Then there is another class of mining propositions, prospects, indicating that by opening up the ground mineral-bearing deposits will be found.

Each class of mines requires different treatment. Those which yield such rich ores that every ounce is worth careful handling are rare and the best practice is to take the

course usually recommended by boards of directors not skilled in mining and get ore, not with such eagerness, however, that mining operations are so conducted that future work must be more and more expensive; but get ore without too much regard for future operations, because such mines usually do not last long; and though some do continue to great depth it may be taken as a rule, to which there are some exceptions, that very rich mines do not last so long as others, and the best practice is to make a drive for all that can be had in values without great equipment. When such a proposition is presented it is fair to take a chance on it, if the capitalization is not high; but where a rich ore is reported running into the hundreds or even thousands to the ton and a great equipment is proposed, that proposition is safe to let alone, because the chances are that the ore obtained will not be worth the cost of the equipment. Of course, there are exceptions, but chance rules in mines and the chances are that a very rich mine cannot be a big mine and therefore a big equipment will be out of place.

The second class, those mines which yield good ores, require very different treatment, and from the viewpoint of a stockholder, the following steps should be taken as good mining practice.

At the beginning of the proposition, while the mine is still an undeveloped prospect, the shares should be sold at a low rate, and the money obtained applied to work of development; not to the purchase of machinery or to arrangements for selling ore, but to development work and nothing else. The shares should advance in price as this work progresses, and the presence of ore bodies is established and ore reserves are blocked out; that is, opened by first sinking down a shaft near the vein, and at a certain depth cross-cutting by digging a tunnel from the bottom of the shaft to where the vein should be; and then finding the vein as expected, drifting, that is, tunneling along it; then an assured expectation can be entertained that the vein found on the surface and encountered again by tunneling from the bottom of the shaft extends from the surface down to where it has been encountered, all ore, a body opened up and ready to be taken out. This practice may be varied, but the principle is the same, the operations should be to prove up a large body of ore before going to the expense of erecting machinery. Sometimes the mine is so formed that the shaft can be run directly on the vein itself, a very satisfactory method of proving ore when it can be done to advantage; but usually the shaft is placed near

the vein and no attempt is made at burrowing, that is, following the irregularities of a mineral formation for the sake of always working in the ore. This is not now well regarded, although it was the ancient practice.

In other mines, where the mineral deposits are found high among the mountains, the situation admits of tunneling to reach the vein, rather than sinking down a shaft beside it, but the principle is the same, the object being to open up and prove the presence of the ore from the top, or outcropping of the mine, to the place at depth where the vein is cut; and having established that an abundance of the ore is there, the next step is to equip the mine with machinery to treat the ore. Good practice is to make careful test, and when a plan for treatment has been satisfactorily proven the plant can be purchased with assurance that the mine will be successfu'

Where a proposition is presented under conditions of operation as here outlined, it is a fair risk to take a chance, provided that the price is right. At first, before the mine is opened, the share should be very cheap because everything is risk, and if enough shares are not sold the mine may never be opened up at all. Then, as the work proceeds, there should naturally be a gradual advance in the price asked for the

shares, particularly so if proofs of mineral to be found at depth are brought to light; until, when the ore is found at depth there should be a material advance; and when the ore bodies have been drifted on, and proven as to extent a good price should be asked for the shares. Finally when the equipment has been put in place and the mine is set to earning dividends a high price should be asked and will be had, because then everybody wants the investment; and those who took the risk at first, and would have met a total loss if ore had not been found at depth now have their reward.

Sometimes long periods pass in development work; often it is carried on too far, and when once a paying ore deposit is encountered, it should be operated, because the object of mining is not to develop a fine engineering plant, but to get ore and get it with the least possible expense. This being held in mind, it is fair to take a chance in mining where good prospects are reported on the authority of one who knows what indications really promise good prospects, and those in charge of the proposition propose good mining practice.

In the third group or class of mines, where lower grade ores are found, good practice is the same as has been stated, but it must be car-

ried out with greater care, because the equipment required to make money out of low grade ores is very costly. Much money must be raised, and before such large amounts are risked the presence of a very great deposit of the ore must be established; and the mine opened up, and proved at several different points and places, to establish beyond peradventure that great bodies of ore are at hand to supply the extensive plant which must be operated to make money out of low grade ores.

With mines in prospect, that is, mineral ground where ore deposits are expected, but are not certainly known to exist, all is speculation, and usually the chance is poor and safe to let alone. However, as sometimes strikes are made, and prospects worth but a few cents a share advance to dollar values over night, some people will be willing to accept the risk, and if the shares are cheap enough it is a fair gamble, nothing more; yet if the management is honest and their plans for exploration vigorously prosecuted, the risk can be taken, but only at such prices that if the mine wins out the profit will be manyfold the money put at risk.

These general statements give but an outline of the different questions involved in the physical development of a mine. Incomplete cer-

tainly, but if the proposition is looked at with critical analysis along the line of inquiry here suggested an accurate opinion can be formed as to whether the physical development of the mine is proceeding along lines which indicate success.

III

Why Mining Companies Fail

The admission must be made with regret that most mining companies are failures, but while this is true of mining it is also true of all companies; for the records show that some ninety per cent. of corporations are failures, and go out of existence, many of them after only a year's existence. This being the fact it must be admitted that failures in mining are not more frequent than among ordinary corporations; still the fact remains that most mining companies are failures, a large majority of them; which in the aggregate represent the hopes of thousands come to naught. Why this should be when mining is such a profitable business seems strange, for one would think that records of successes would be more pronounced, and must look with interested concern at the causes which produce such bad results. The reasons why are many, and those who hold mining stocks should take heed of these reasons, and perhaps discern approaching failure in time to protect their holdings. Of

the reasons why mining companies fail, one, a potent reason, is scarcely known. It happens many times that the stockholders bring about the ruin of their own interests, and put burdens on the efforts of those who have the enterprise in charge which doom the company to certain failure. Rarely it happens that the progress of a mine is up to expectations, delays and difficulties are almost sure to be encountered; and then comes criticism, and they who own the shares bewail their disappointment, and declare they have been cheated, denouncing often that the undertaking is a fraud, and, bringing it in ill repute, make further progress well nigh an impossibility; and the enterprise discredited becomes a dismal failure, where a good word in support of those who had the enterprise in charge might have brought about a great success. If a management is found to be dishonest, those who have bought the stock should lose no time in taking legal action, and not be content with idle words of disapproval. Where a management is found to be just, and making due effort to attain success, even though disappointments are encountered, that management should have a good word now and then to help their efforts, and it is a poor man who speaks badly of that which he owns himself; if he does

so, he should not expect anything but deterioration in the values of his property.

Here are some of the reasons why stockholders become dissatisfied and criticise. Results may not be quick enough to suit them for which the management is frequently denounced. It may be that some who have taken a chance on an unestablished mine at a low rate wish to sell out their holdings, and in place of looking for a purchaser go to the management demanding that the stock be immediately repurchased from them; forgetting that those who have gone in together to prove up an untried mine are in fact, if not in law, partners, the money which has been subscribed must be applied for work on the mines to benefit them all, and that managers who are so engaged have not the time to leave their work and hunt up a purchaser; then it may be that the mine requires all the money which the managers can raise, and to divert some of this money to repurchasing shares which holders may wish to sell might work serious injury to those who are not seeking to dispose of what they hold. For these reasons, while a mine is going through its stages of development those who buy should do so with the full understanding that such shares bought at low prices must be held and put away till the mine

has been developed, then, of course, shares can be freely sold.

This cause of failure, the denouncements of those who have purchased stock, is one far reaching cause why mining enterprises frequently end in disaster, because when once adverse criticism is in circulation the management can no longer sell shares to keep up the work, and then the enterprise becomes a failure.

Another among other many causes leading on to failure is that competent engineers are not employed. Probably no cause is more prolific in unfortunate results. A miner once said to me that when a man had made a failure at everything else he took up mining, and soon considered himself an expert. This is a good criticism, but the man who made it was himself a most outrageous failure, and well illustrates the criticism. He was pleasant, aggressive, a talker, knew it all and more; persuaded people to place money with him and then obtained for them no results of any kind, not even a property held under title. Here we have a frequent cause for failure, and if those who thought of buying mining stocks would assure themselves that those who were to have the management were competent there would be few bad investments made in mining.

As stated in a previous chapter an over capitalization where less than a due proportion of the stock is represented by cash, or real property, tends to make mining unprofitable for those who have invested. Frequently we hear that such or such a mine is making money, but the capitalization is so high that nothing can be paid in dividends; a condition which may continue during many years, and such a mine cannot be spoken of as a success. This adverse condition of over capitalization should be counterbalanced by security on the property itself with preferences for interest for the benefit of those who may invest money in the enterprise.

Among the causes which lead on to failure a form of dishonesty called "graft" in current slang is very potent, and hard for stockholders to control; perhaps it never will be held in check, and it is mingled with all the forms of dishonesty which may be practiced in a business such as mining while the enterprise is being organized where at the start untried men and unestablished usages are brought together, new equipment, new accounts, everything untried; it is small wonder that efficiency of results are often low and that at a time when mistakes are apt to bring on a disaster money misapplied means ruin. Dishonesty is very

prone to visit all human affairs, and as yet no really well established form of checking up against it has been developed; yet in mining it could be done if the stockholders gave more attention to their own interests, and had independent auditing committees which might call for reports at any time, and make actual physical inspections, employing competent engineers to give them information as to what the true conditions might be on a mine, then there would be very few losses from misapplication of the funds. Unfortunately stockholders are so indifferent that there is small chance that auditing at sudden, and unexpected times will become the custom; and inefficient application or perhaps misappropriation of funds will always be a potent factor among the causes why a mine is not brought to success. To watch this condition is not easy, but where it is found that promised results are not obtained, and the management cannot give a good reason why this is so, the stockholders should take steps to have committees formed to make investigations, and if necessary place a new management in charge.

Another very frequent cause for disappointment of results is that machinery set up to do the work of winning values from the ore will not give such returns as were expected, and

frequently the enterprise must then be abandoned or closed out to other people because lack of funds will not permit the management to purchase and set up other kinds of machinery. Against this difficulty a prospective stockholder has poor opportunity for protection, and can only ascertain that the plans for treatment of the ore were drawn up by men who are competent in such work, and who are not themselves interested in selling machinery on which they reap a special profit.

To all these causes why a mine may fail there is the ever present possibility that the ore may not hold out, that its character may change and not be suitable for treatment with the machinery which has been established; but where the mining practice has been good the loss from this contingency should not be so very great, because, before great expense has been incurred for machinery with all the cost of setting it in place, the mine will have been tested, the veins and deposits proved, and then the heavier expenses of equipment are not such a risk.

I do not call that mining enterprise a failure which undertakes to see what there may be in a likely prospect and finds inadequate supplies of ore. If honestly put forward to those who may invest, and the plain statement made that

it is on a prospect only that the hopes are based, then if money is properly applied the results for which it was subscribed have been accomplished, and any enterprise which accomplishes that which it has undertaken cannot be called a failure. In opening up a prospect the object had in view is to ascertain whether or not the indications will lead the operators to paying ore, and money so lost can be considered spent in legitimate enterprise and efforts—and stocks in exploration companies have great possibilities to win most excellent returns. A disaster is different from a failure in mining. A disaster is loss. A failure in mining can be considered as such only when ore has been found and the management fails to obtain adequate returns. Whatever may be the miscalculation if the mine produces ore and does not make money for its stockholders that mine is a failure.

The conditions which have been noted are those which principally cause disasters or failures in a mine, and people who think of making an adventure of capital in a mining proposition should study the conditions, and take the risk only after favorable indications have been proven, or at least strangely indicated from an independent source of information.

IV

Success in Mining

A good old saying often heard is "Nothing succeeds like success;" a better rendering would be, nothing succeeds like mining. Not anywhere are such profits made, nor in any calling are there such sudden tidings of good fortune. A stock selling for a few cents a share develops an unexpected demand, and presently is worth a large amount of money; so much that in many instances a few hundred dollars have returned abundantly and the fortunate possessor finds sufficient income to live comfortably for a lifetime. Such results are worth a risk, and so many instances have been known that there is always a chance that even in the most discredited stocks a strike may be made and great returns result. It may be so provided that the mine is in operation, for between the stocks of dormant mining enterprises, and mines which are in operation there is such a difference that the same conditions which would be favorable in one would be adverse in the other class, and, when considering

success in mining, the two classes of stocks must be taken as entirely different. A mine in operation has always a chance of an achievement, and a great success. A mine lying dormant has no chance at all, till some arrangements have been made by which the mine may be put in operation, then it may attain a great success, or like any other mine it may drag on for years and come to nothing in the end.

Success in mining for the stockholder is to select and make investments where profits are obtained, and such results develop out of careful mining practice, good management and honesty in operating a property of merit. In making his selections the investor is at some disadvantage, for he must take the statements made by others, but in forming an opinion one should know the elements and the conditions which most probably will lead on to success.

We would all like to invest a little money, and have it win a competency; and it can be done in mining if one understands the conditions of the venture, and waits till the right opportunity arrives. This is an important point to be considered; if one would make a success at mining, one must wait till a real opportunity arrives. An opportunity does not come with such great frequency, and usually a good mining proposition does not have to seek very far

to obtain backers, for which reason those mining propositions seeking capital by much pushing, advertising and inordinate claims for values must be considered as most doubtful, and safe to let alone. An incident will illustrate the fact. An advertising writer making a specialty of mining literature said recently: "Well, for the last eight years I have been writing up the dope for mining propositions and have seen sixty or more draw good money from investors." Asked how many of these enterprises had been successful he replied that only one had turned out well, another might have given good results but the superintendent was dishonest to such an extent that a receiver was appointed and the mine closed out to others.

In sixty mining propositions one only was successful, and how is the investor to pick the one when all the others, though great promises are made, are unsuccessful. Rules for judging a mining proposition will be attempted in a later chapter, the object had in view at present is to describe successful mining and the different stages of development which lead up to success.

It is a favorable indication when the mine seeks capital from general investors, that those who have the enterprise in charge are not de-

pendent on the product of the sale of shares for their own livings; and more than this can and do risk some money for their own account, and where such is the case it is a fair proposition to join in with them. The first step in the development of a successful mine is that people of some responsibility are interested in it. Such people usually proceed with caution, and inform themselves before they take a risk. A mining proposition brought to good business men has been considered, and they are impressed by what is said; usually their next step is to send for and obtain such local information touching on the property as may be available; and these reports confirming what they hear, the next step is to call a competent geologist, who is asked to give an opinion on reports and samples; and he, thinking well of what he sees, is sent out to examine, and finding that the ore deposits promise well advises that the business men take up the proposition. Probably an agreement is now made with those who own the property, the business men take up the enterprise, and their next step is to send out a mining engineer, who passes on the proposition in its engineering features, and finding that the mine admits of successful operation makes his report and recommends equipment. Before this equipment is purchased ar-

rangements are made to open up the property, and prove that the ore is there in quantities, which the geologist found indicated; and now a contract to a competent miner is let out. The business men apply business methods, and make contracts for their work, the same as would be done in any work of construction; they do not undertake to forward money for day labor to be performed in a distant place. The miner having the contract sets to work, and after a few days begins to send reports showing that the mine is opening as the geologist expected, and the indications seem most favorable. But about this time the business men find that the money required makes quite an investment and they resolve to seek aid from investors. A plain statement is then drawn up, showing just what the values are, the prospects, the reports which have been made; not "dope" and flamboyant literature, but a plain concise statement of the facts and with it offering stock at a fair valuation. It is natural that an offering such as this would find eager buyers, and usually the acquaintances, associates and friends of the practical business men supply all the money which may be required to meet the payments, on the contract; then when this contract has been carried out, and good bodies of ore have been proven to

exist, and, usually a mine examined and reported on favorably by a competent geologist and a competent mining engineer does turn out well, and the ore having been proved, the next step is to set up the machinery. Another statement is prepared showing the values which have been proven, and subscriptions are asked at better prices for the stock, but prices based on actual values, and prety certainly the offering is quickly taken. Then a competent mining engineer is put in charge, other contracts are let, presently the machinery is all in place and put in operation, and it is but natural that a mine so managed will be successful and yield full returns for many years.

Unfortunately, such good management is rare, and those who know so little about mining that they proceed without any caution are frequently in charge, and with flamboyant dopy literature, and glowing advertisements promise the immediate returns they so confidently expect, and glorious fortune easily obtained. If only such great promises could be fulfilled there would be many rich; most unfortunately, however, success but rarely follows efforts at hurried, little skilled and speculative mining.

V

The Relation of Mining Stocks to the Properties Back of Them

A question which should be among those most carefully considered is, what may be the relation of the stock offered to the property back of it. In other words, what does the stock represent? It may be a share in actual ownership, it may be a share in contingent ownership, it may be a share in prospective ownership, it may be a share subject to previous liens or it may be a share with but limited rights. All these different conditions affect values, and one who buys a mining stock surely ought to know what it is, and what it really represents.

Whatever may be the form of ownership the question of share divisions is very important. It is of small consequence what the capitalization may be, the important matter is how many shares are there? If a mine were capitalized for one million dollars, and there were only one share, that share would be a title to the whole property, and would be worth whatever

the mine, option or contract might be worth. If the par value of the shares were placed at one hundred thousand dollars each, there would be ten shares in the million dollar capitalization, and each share would be worth one-tenth of the value of the whole property. If, however, the shares were of one dollar each, as is usually the case in mining corporations, there would be one million shares and the value of each share would be one one-millionth of the value of the whole property. This fact must be carefully held in mind when one proposes to buy a mining stock. How many shares are there? What the capitalization may be is of not any importance. A mine capitalized with only ten dollars and only ten shares of one dollar each is exactly the same in ratio to value as a mine capitalized for one million dollars with ten shares of one hundred thousand dollars each. There would be ten shares in each instance, and whatever the mine might produce would be divided in ten equal parts, and each share would get a tenth. Similarly if a mine were capitalized for one hundred million dollars with shares of one hundred dollars each, and another mine were capitalized for one million dollars with shares of one dollar each, both mines would have one million shares, the ratios of ownership would be the

same and each share would be entitled to one one-millionth of the product of the property. From this it will be seen that the par value of the shares is an idle thing not to be considered. The question is how many shares are there? And it would be better if mining companies were incorporated with no specified par value and were offered to investors as so many shares. A mine divided among a million shares, a mine divided among a hundred thousand shares, or a mine divided among a thousand shares. The incorporation laws of the United States require that a par value should be specified, and under these conditions the best an investor can do is to disregard the par value and inquire only as to how valuable the mine may be and how many shares there are among which to divide the products of the property.

This being in the mind of an investor, and having inquired as to what the mine may be worth and how many shares there may be, it is next in order that inquiries should be made as to what the shares may represent. If it is actual ownership the conditions are the best, and where a mine is so held it must be shown that the property has been fully transferred to the company, that there are no restrictions in the title and that the company is the owner,

free and clear, an actual estate in fee. Unless the mine is so held the stocks are risky propositions, and except the prospects are far better than the ordinary, had best be let alone.

Where a property is held under contingent ownership, the company will own the property in case it complies with certain conditions which it may or may not be able to carry out. A company incorporated to take a property under bond and lease is one instance. If it has the amount required the company will own the property, and the shares will represent something; but if it does not succeed in paying the amount required, it will forfeit all its rights in the mine, and the shares will represent nothing, and if an investor thinks of buying under such conditions he should weigh well what the chances are that the company can meet the requirements; for if it does not the shares can never have value of any kind at all.

Many of the rich mines in Spanish American countries are held under concessions, not titles, and a concession is nothing but a contingent interest. The company is given the property provided that within a stated term of years it will complete some work of public utility, usually an expensive road to be constructed from some part of the country to an-

other; or public buildings or other utilities may be specified as the work required, and in every case the title is contingent on the completion of the work. Such properties are nothing but contingent interests, and frequently very doubtful ones at that; for those who grant the concessions are shrewd men, a Yankee isn't in it with a Spanish American when it comes to arranging a contract in which a sharp bargain is concealed, and usually those who hold the concession find that to fulfill the conditions under which the occupancy of the property has been granted requires an amount of money much greater than was expected; and if the conditions are not fulfilled, and the public works are not delivered in the time specified, then the shrewd Spanish American officials simply carry out the terms of the agreement as its specifications require, call on the company to complete its bargain; and if it fails they simply take back the property again with all the improvements which may have been placed upon it, and the shares of that company then represent nothing, not even dormant ownership.

Thus many dangers are sure to visit the company holding property under a contingency, and who buys shares in such an enterprise should have a care and see just what the

chances are, and how strong the company may be to give assurance that the title will be successfully completed.

Another form of mining proposition causing frequent loss is one in where the shares offered represent prospective ownership and nothing more. Usually such shares are issued against a contract to acquire a property or an agreement to explore a property, and take it over if found satisfactory. The stocks of the exploration companies generally belong to this class of issue. Where property is offered with a clear statement of what the shares really represent this basis of organization is a just, legitimate and often a very profitable form of mining speculation. Frequently the true facts are not stated with clear precision, and the investor subscribing to an exploration company, or to a company organized to test a mine, or one in which there is simply a lease, is given the impression that the assets are in a stronger position than really is the fact. As stated, however, this is often a desirable form of mining speculation, but the shares should be either of very low price, or there should be very few of them.

Frequently an exploration company is organized with a very few shares. Perhaps ten men may each put a certain amount of money

in a pool, and send an expedition to explore for, and acquire mines, and certainly the enterprise is legitimate. Another form of contingent ownership is where indications of mineral have been found, and a company is formed to search the ground, and if found promising to acquire title. This too is a legitimate form of operation, and many successful ventures have been made in such enterprises. Another form of prospective ownership is the lease where the company owns nothing and can only own such ore as it may be able to take from a property in a given time, less the royalties, or payments which must be made to the owner of the property, so much percentage of the value of every ton of ore the leaser may take out. The ownership in such an organization is simply the prospective ore the company may succeed in winning from the mine. Such enterprises have been very profitable, but are not permanent except when a long lease has been obtained, in which event a longer life may be expected for the enterprise; but in any event the capitalization should be low, that is, there should be only a few shares; or if there are many the prices should be very cheap, and an investor should look to it with great attention to ascertain that the enterprise is in competent hands.

Those companies which are organized sub-

ject to mortgages or previous liens are rarely to be well considered, and are often very deceptive, because a better value can be indicated than the facts will really warrant, and yet those who put the enterprise forward may keep well within this law; for what importance is it that a mortgage, or a lien for payments, should be on a mine such as the property the promoters are putting forward; a few shipments and all the mortgages and liens will be paid, at least so the promoters think and if the investor thinks so too he should take a chance, but a wise investor would make pretty thorough investigation before placing his money at such a hazard.

Companies issuing shares with limited rights are not so many in this country, though preference shares are not uncommon, called usually in this market preferred shares; but in foreign companies obligations to pay out of the earnings, large proportions to founders, discoverers and others often burden a mine to such an extent that the shares have very little real value; especially if the preferences are in the form of obligations to be paid first before the shares have participation. These arrangements give the shareholders but limited rights in earnings, and should be carefully investigated. Other limitations may restrict the value of the shares,

and one, which is present in almost every mining proposition, is the limited voting power which is granted to the purchased shares, the shares which represent the real money which may have been invested. According to the law each share has equal voting power, but if one man holds the majority of the shares, or if this majority is held by a group of men closely associated, they can vote as they fancy, and do just what they please with any property. Elections of officers under such conditions mean nothing, the promoters appoint them, that is all; and where it is found that the shares representing actual money invested are in a hopeless minority the investor should look well to the character of the men with whom he is taking the risk, for if they are not competent in mining as a business, results are apt to be very unfavorable, even though the mine they have in charge may be most excellent.

The fact that promoters, and organizers, usually control a corporation by shares voted to themselves is, in the opinion of the author, the paramount evil in mining investments, the one unfortunate condition which if remedied would make mining stocks one of the best, if not the best form of speculative investment. The people who have provided the money represent in most cases only a minority inter-

est, and must submit to the will of the majority—in most cases the promoters and organizers. Sometimes those who control fall out and begin fighting among themselves; then those who have invested receive but scant consideration. They represent a scattered minority unknown to each other, and can do little in their own defence. The object of this book is not to theorize, or suggest legislative remedies. It would be well if laws were enacted to protect a minority of stockholders who had invested money against a majority interest in a corporation who had, at the organization, voted shares for property, but had really taken most of them for their own account; but such laws have not been passed. No matter what the relation of the stocks may be to the property back of them, if a closely associated majority interest is in control the investor must depend on those men, and on those men only. Therefore it behooves those who risk money in mining carefully to scrutinize the stock lists, and find out who is in control; this is really more important than the conditions of organization.

VI

Speculative and Investment Value of Mining Stocks

The question of what value to place on a mining stock is one involving several calculations. A mine is worth the value of the ore it may contain, less the cost of getting the value out, and turning it into money. If the mine being considered is a gold proposition the question of turning the product into money may be disregarded because the product is money. With all other mines the question of converting the product into cash must have serious attention.

A mine may be compared to a treasure vault in which there is money, but how much the owners cannot surely tell, nor have the means of ascertaining with great accuracy, and it would be difficult for them to say what they were worth. So with a mine, it is a treasure vault in which the amount to be obtained is hidden, and there is also an added inconvenience, that each time the treasure vault is opened, each time values are extracted from it, considerable amounts of money must be spent. To such great extent must money be expended

that frequently it happens that visits to the treasure vault may, and frequently do, result in expenditures greater than the worth of the materials taken out. What then is the value of an opportunity to take values hidden in the treasure vaults of the earth? Value the opportunity must have, else mining stocks could not be sold, nor would large amounts be expended in making an entrance of shafts and galleries in seeking after these treasures which are unseen, but which indications promise. The inference is largely speculative, and as the ground to be opened, even in the well established mines, is always an expectation, not a known condition, the element of speculation is present always in a mining enterprise. Even where no ores are known certainly to be present yet where strong geological indications make expectations reasonable, there must be some value. It is a chance to make some money, a chance difficult to reduce to any basis of firm calculation, for if a man felt sure and considered it a demonstrated certainty that he would make a sum of money in a given transaction, a gain of ten per cent. would be sufficient to warrant the undertaking. So in a simple calculation we may assume that a chance to make some money which may be considered secure is worth ninety-one per cent.

of the amount involved as a first investment. If the risk increases, the amount of worth for the value of the risk falls lower, and a man who would be glad to put out money on good security to gain ten per cent. would hesitate to put out the same money on doubtful security even though the gain, if made, would be twenty-five per cent. Naturally he would ask for special provisions if the risk were taken, and if the profits indicated were very great he might be induced to take a risk to a limited amount of money; and this is the risk which is taken in the purchase of a mining stock. It is worth something and the rate can to some extent be calculated. If an investor buys a stock on the expectation that it will return him double the money he has risked it is fair to consider that he was willing to put out money on what he thought were good expectations that it would be doubled, and would make for him one hundred per cent., as it is commonly called; that is double his money. If a stock is bought at one-fifth what the investor is led to expect he may obtain, then he takes a risk to recover his money and four times the amount as well, or four hundred per cent. profit, as it is somewhat erroneously called, because a per cent. is a decimal of a hundred and cannot really apply to more than one hundred parts; but it has

become a common usage to speak of gains beyond one hundred per cent. and used in this sense one hundred per cent. has come to mean one fold, and five hundred per cent. return is taken at the meaning of five fold return, or five times the amount put out obtained as a profit more than the original investment; and as money has come to be expressed in dollars and hundredths of dollars or per cents., the usage is not inconvenient and as it expresses clearly the meaning one would convey it may be considered a development, not an error, in a language.

Using per cent. in this sense we may say that a stock selling at 50% of par is taken for 100% profit if the purchaser expects that it will sell at par. Similarly a stock bought at 20% is taken to obtain a profit of four hundred per cent. A stock bought at 10% of par is taken on the expectation of winning nine hundred per cent. and a stock taken at one per cent. of par is purchased on the expectation of winning ninety-nine hundred, almost ten thousand per cent profit. Such profits are possible in mining, and we can speak of the speculation value as a venture for a hundred per cent. winning, or as a venture for winning many thousand per cent. The actual worth of such a risk, and opportunity is of an equation so variable and

fluctuating, that the only calculation which can be made for the speculative value, is to take the actual value of a mining stock, and add to it an allowance for the speculative value, but this allowance will be each man's opinion. The investment value of a stock can be calculated, and this being known, what would one give in addition for the stock because of the speculative value, the chance in every mine that some great body of ore of high worth may be uncovered; and the further chance that a paying mine may continue as it is for many years and so become a source of long continued profits.

In the course of mining events, and all the chances of the hazard a mine must some time in its history reach a point where no more mineral can be had at a profit, so the chance of loss is equal, and perhaps more imminent than the chances of greater gain.

In considering an investment value of a mining stock the calculations can be based on something more tangible than the uncertainties of unknown values. Where good mining has been practiced, the mine has been opened up, reserves of ore are established, geological studies and surveys carefully made, and machinery constructed which the mine can keep supplied for many years. Then a calculation

based on known, or at the worst, probable conditions, becomes more of a certainty; and the geologists of a well established company can say ore is in assured supply for such and such a term of years, and that the expectations of increased values, and the continuation of the veins and deposits can be reasonably counted on for such and such a term of years.

On this information a value for the shares can be calculated. If the mine is reported on as good for five years with prospects, that the assured values will continue, and further reserves of ore will be opened up, then the mine is on a five year purchase basis, and if the price of the shares is such that the net dividends will be just 20%, then all the speculative values are obtained for nothing, because at 20% the money invested will be returned in five years and the mine has five years supply of ore in sight, then all which remains representing the speculative values will be clear profit. Usually the owners of such a property want something for the speculative values, and what is paid beyond the five dividends or 20% valuation may be considered the price one pays for the speculative value.

If a mine is reported to be good for ten years dividends one might consider buying it on a 10% basis, and at that rate one's money

will be returned in ten years, and whatever the mine is worth at the end of ten years will be the profit; but if by chance there is a mistake in the estimates of the ore, and not so much is obtained as had been expected then there is a loss on the investment; on the other hand better and more extensive ore deposits may be encountered; though ten years is a long period and the element of chance cannot be eliminated but it may be fortunate, and if the calculations of ore in sight have been made by competent people it should not fall below the estimate. If ten years supply is in sight and one buys at a rate to pay less than 10% then the difference is what is paid for the speculative chances. Similarly a supply of ore to last for 20 years may be reported, then if this is proven one could buy on a 5% basis, and in twenty years all the capital would have been returned and whatever the mine might be worth at the end of that period would be the profit. From these estimates we may assume that the speculative and investment values of mining stocks go together and cannot be entirely separated; consequently one who buys should take both elements into consideration. The proven values should give the money again in a certain term of years which one may calculate from the dividends being paid, and the reserves of ore

in sight as estimated by competent authority; these are the investment values and one can calculate how much they are worth, and if one pays more than this one should consider the difference between the price paid and the investment or known values, as the price he pays for a chance to make some money and thus consider carefully whether the opportunity and expectation is of that much value.

VII

The Geology of a Successful Mine

In place of this chapter a volume could be written, and then the subject would not be exhausted. The object of the present work is not a scientific treatise, or even a guide for engineers. Such ambitions are far beyond our objects which are simply to give the facts which will bear on the advisability of accepting a mining proposition, and some little information touching on the relation of mining to geology will be desirable. There are many forms of ore deposits, and of these large deposits moderately rich are more favorable than small but immensely rich formations. An assay tells very little of what may be expected from a mine. Suppose a mine ran fifty thousand dollars to the ton, as sometimes has been found; it sounds attractive, but usually such deposits are so very small that they scarcely pay for working. If this fifty thousand dollar ore were taken from a seam, or pay streak, less than an inch wide, the mine would not amount to much, because great tunnels or expensive shafts would have to be opened to get at the ore; and when one did get at it there would

not be enough to compensate for the expense, and thus we can see that the important question to consider is not how rich but how abundant an ore may be. A mine having hundreds of thousands of tons of ore easily worked, and worth ten dollars per ton would be a mighty fortune, where a mine containing but a few tons of fifty thousand dollar ore might not give any returns beyond the expense of opening the property, and, perhaps, even not so much as this; for the expense of opening tunnels, and sinking shafts might easily amount to more than the value of the ore obtained.

The question, therefore, in first considering a mine is not how rich the ore may be but how much there may be of it. A big mine is the best though rarely yielding the richest ore.

Of the different forms of ore deposits we have most commonly vein formations, and in almost every prospectus the claim is made that the deposits occupy true fissure veins, and when such claims are presented it would be just that the prospective investor should ask the promoters to prove it. Fissure veins are rare, and in their largest meanings indicate fissure or cracks in the earth's crust caused by some great seismic action, and extending to the depths of the interior earth far beyond the point to which man's efforts can follow them.

Cracks in the rocks, though they may be extensive, are not fissures in the earth's crust, and should not be spoken of as fissure veins; yet everywhere we find the claim made, true fissure veins, but of these there are few well defined examples in all the world; and for a long time it was claimed that in America true fissure veins were not to be found at all, but this is not the fact, and several have been reported on by eminent authorities.

A fissure in the earth's crust, and cracks in the rocks, these two are commonly claimed as fissure veins, and is not a crack a fissure? Certainly it is, yet a fissure vein is not a crack in the rocks, but a former great opening in the earth's crust which has become filled up with mineral bearing ores. A fissure vein must be large, the sides or walls well defined, it will extend for some distance, and pass through two or more different rock formations, but if the ore deposit is found occupying a vein in one rock formation only it is usually a crack or local fissure in that formation. It may be large and of importance, but it can never be so large as a fissure in the crust of the earth passing through all rock formations down to unknown depth and should not be called a fissure vein.

The formation of ore deposits such as

are usually worked, may be for ordinary usage divided into but three classes, though scientifically many other classifications are required to accurately describe the different forms of ore accumulations. For ordinary investigations it is sufficient if we consider the three kinds of ore deposits as follows: Those which have been derived from mineral bearing solutions, and crystallized, percipitated or replaced out of the solution; next those which are simply accumulations of the ore by mechanical means, and, finally those which are eroded out of the surrounding rocks, and have collected in gravel, or sand beds, called placer deposits. All these forms present numerous modifications; the mines formed from mineral bearing solutions generally belong to periods of heated activities during which fissures were developed in the earth's crust, and cracks, and gaping rents were formed among the rocks; and heated waters, rising vapors and chemical changes exerted their influences to form ore deposits. Subsequently waters proceeding from the depths of the earth forced upward, or percolating downward from the surface, or following drainage zones among the rocks dissolved out minerals, on their way encountered sulphides, and first rusting and then dissolving them became acid, thus increasing their activities in

dissolving minerals, till they became overcharged; and as a result threw down some of the burden in cracks, rents and cavities or fissures; continuing the action for a long, long period of geological formation; continually depositing a little and a little, till at last the veins were filled, and the mineral bearing solutions were forced, perhaps, among all the surrounding rocks forming outlying trailers as it were to the main deposits. Sometimes a mineral bearing acid solution will have encountered a formation of alkaline rocks, limestone, etc., the alkalie will be easier to carry than the other minerals so the solution takes up or dissolves alkalies and deposits minerals in their places; and similarly lime waters which are alkaline, and may be mineral bearing, will, on coming in contact with acid rocks, take up the acid element to neutralize the alkalies and deposit mineral in the place. Under some one or another of these forms the ore deposits found in veins, seams, cavities, cracks, contacts, replacements or fissures will have been formed; but the only questions which interest the investor are how big is the deposit in which I am asked to take a share? How rich is the ore? And will the mine continue production long enough to return a profit on the money which I may invest? To answer these questions one must be in-

formed of all the intricate science of economic geology, but a few indications can be given.

A mine found among the rock formations should occupy a well defined space, the larger the better; and the ore should be fairly even in appearance, texture and assay valuation.

The ore should show values in a reasonable distance from the surface, two to fifty feet; there have been notable exceptions, but as a usual condition a mine does not grow richer at a greater depth. For a time values increase, then deeper still decrease, and when the water level has been reached the permanent values are developed and usually these are not so great by far, and sometimes the mine becomes so lean that further work must be abandoned because it will not pay.

Other forms of ore deposits are developed by mechanical accumulations; these are iron deposits, coal beds, zinc or lead accumulations as residuals from rocks which have been wasted away; and less abundant chromium or manganese deposits, residuals from rocks which have contained these elements. Here a mechanical action takes place, the material is accumulated through the influence of erosion or the decay of rocks; or, in the case of coal deposits, the accumulation of vegetable material with such rapidity that, continually piling up, it is pro-

tected from the air and cannot oxidize or decay, and so carbonizes to form coal. The petroleum deposits are taken to have originated from fats of animals, and the oils of plants, collected where they would be protected from the oxidation of the air, and gradually the change has taken place too for petroleum. Thus by mechanical means we find that many mineral deposits have been accumulated. In some, both mechanical and chemical influences work one with the other, as in the precipitated salt beds, gypsum beds, iron ores of some regions and other minerals; but the mechanical predominates and in relation to all these deposits the questions which the investor will ask are in regard to size and purity, for deposits of less valuable ores and minerals must be large and very pure; and also so situated that they can be transported at low rates, if the proposition is to yield a profit. If deposits of this class are found to be large, to yield pure materials and to be so situated that the product can be carried to a market at a good profit it is fair to take a portion of the proposition, provided that the price is reasonable.

Those ore deposits called placers in which the material sought is found mingled with sand, gravel or other products of erosion are usually productive of the precious metals, gold,

platinum, and to its allied minerals and also precious stones, and certain of the rare elements used in the arts. The development of such deposits is of great interest, and usually the various stages of formation can be traced in sequence; the washing down, and breaking away of rocks among the mountains, and the hills; the grinding, crushing and gradual wearing down of this material in the streams and water courses and finally the collection of the precious metals, rare elements, or rich gem stones at convenient places. With these formations the questions which should be asked by an investor relate more particularly to the facilities for working the deposit; for if these are good, a deposit which is large though really lean in mineralization may be worked to very great advantage, and substantial profit. If it is big enough—that is the great and all important question and should be considered with special care when investigating any ore deposit. Bigness, however, is but a relative condition, for in a gold mine a vein two feet wide and well defined would, if it carried good values, be of great importance; but as an iron or coal mine would probably be considered not worth operating unless the mineral were very pure, the conditions for mining unusually favorable and a market just at hand. Size is

therefore relative and it may be considered favorable when it is large for the kind of mineral which the deposit may yield.

Another condition of geological formation which should be considered in relation to a mining proposition is the structural formation of the surrounding rocks. If these are very hard the cost of tunneling and sinking shafts will be great, perhaps so great that a loss may result where a profit had been anticipated. On the other hand, if the rocks or surrounding formations are too soft the cost of supporting the tunnels, and openings, so that they will not cave in may be very great, and a heavy charge on the operations; then, as sometimes happens, the insecure formations may collapse causing loss and often death. The proper condition is one where the rocks are firm enough to hold in place with reasonable supports, and yet are not so hard that mining will be attended by more than ordinary expense.

Still another condition must be considered, as it may be very adverse to profitable operations, and this is faulting. The earth's crust is frequently in destructive movement and sometimes it happens that a mineral deposit apparently good at one place may be found shattered and destroyed at another, so that profitable working is not possible. To inquire

whether faults may be expected and give an intelligent report requires skill and long practice, and even then no one who understands the science of economic geology will speak with great assurance. In a general way it may be said that if a mine is located in a country where seismic activities have been in evidence, and the rocks are found broken and distorted, then faults may be expected and the investor should proceed with caution.

The presence of water may seem to some scarcely a geological condition surrounding a mine, yet it is a most important condition and one which must be reckoned with and watched. The water which accumulates in a mine must be pumped out; pumping is expensive work, and may eat continually at the profits to such an extent as to sometimes make a mine unprofitable.

This chapter is but an outline, yet the principal conditions have been noted, and an investor who informs himself in regard to these and finds the conditions to be favorable, will be justified in taking a venture in the property offered to him, but if the conditions do not seem favorable then it would not be well to take the venture, but look for something in which favoring geological surroundings can be found.

VIII

Physical Conditions Which Should Surround a Successful Equipment for a Mine

A mine may be equipped with the best machinery and materials for its operation, but this is not sufficient to insure favorable results. The equipment is necessary, but if the physical surroundings are such that the machinery cannot be operated to advantage the equipment may be a total loss. It seems strange that such a question should be considered, and that those who have an enterprise in charge do not foresee the difficulties; but frequently they do not, and one abundant cause contributing to lack of foresight, is the hope which all possess, the eager expectation, the belief that conditions will turn out to advantage. These feelings with statements from mining engineers, especially engineers who have machinery to sell, that they can design and set up a successful plant, lead on to expenditures which a study of the physical conditions would have deterred.

An incident in explanation. One of the most

successful mining engineers and promoters spent many thousands of dollars, it is stated, on a mine where there was an abundance of good ore situated on a certain coast. The ore was to have been shipped by steamers, but when preparations had been made it was found that neither steamers or any kind of vessel could approach the coast, and that the ore could not be shipped; a detail of physical surroundings, which, in the eagerness to win the great supplies of ore, had been entirely overlooked. To the powerful mining interest backing the venture the loss, though considerable was not disastrous, and the proposition was abandoned. If it had been a mining company raising money from the sale of stock, another would have been added to the long list of mining ventures resulting in a total loss.

When, in the history of a mine, the period comes in which machinery is to be ordered, dependence must be placed on the skill of mining engineers; and while they may make grievous mistakes at times, usually the equipment they recommend after due examination of the property will do the work; but too frequently incompetent men are employed, or, worse yet, a so-called practical miner is put in charge and then disaster will be almost certain.

The science and practice of mining is divided

into three distinct branches in the hands of the geologist, the metallurgist and the mining engineer. The geologist reports, or should report, first giving a clear statement of the ore formations, the probable extent of the ore bodies and the physical conditions which surround the mine to facilitate or retard its operations. The metallurgist should then study and report on the treatment which the ore may require in order to extract the metals successfully. The mining engineer should then take these reports and design his machinery to meet the conditions which may have been found, provided, of course, that physical conditions have not been encountered which indicate that no profit can be had in operating the mine. The work of the geologist and metallurgist can be, and frequently are, undertaken by one man; but the preparation and designing of machinery requires such a different train of thoughts and education that the mechanical and scientific parts of mining do not combine to advantage in the hands of one person; and this is a frequent cause of loss through errors when geologists and metallurgists attempt to design machinery, or when engineers attempt to make the geological reports. One not being trained in the specialty of the other overlooks some details resulting often in disaster for the

enterprise. When an investor is asked to take a venture in a mining proposition he should inquire whether the reports have been made by competent and qualified men, and that an engineer has designed the machinery who is not only qualified and competent but is also disinterested, and is not to profit by the sale of certain machinery which he may recommend. If the question of designing the machinery is in competent hands, of an engineer who has received reports from competent people so that he is well informed as to the conditions with which his equipment must contend, the investor can ask no more; and expectations for success are on a strong foundation. If, on the other hand, the investor learns that the different examinations and surveys have not been carefully made by competent men, and that the mine is taking a long chance on expectations, then inquiries should be in order and certain conditions looked up with care. Those conditions which may prevent the successful consummation of plans in mining ventures are, some of them, as follows: Often a mine may be abundantly rich but inaccessible to an extent that the cost of setting up machinery would be so great that profits could not be made. The recent developments of mining interests in the State of Nevada are to some extent an illustration.

Years ago these mines, which with better transportations are now in eager demand, were known and some of them even located, and in places attempts at working them were made, but almost all gave no results; the costs were everywhere too excessive, and for years Nevada lay a great abandoned camp. Tales of riches came from time to time but always little heed was given, conditions for maintenance were too unfavorable, machinery would then have been too costly in such remote places; and even now mining must struggle with adverse conditions of transportation in Nevada, and some must wait till better facilities can be provided. In former years I frequently had offers from prospectors with requests that I would introduce them to men of capital who might be induced to provide money for making and maintaining mineral locations in Nevada. But in those days mining propositions had but little favor, and no one cared to risk money against the then adverse conditions in the deserts of that state. Probably this was an error of judgment, because to acquire a promising mineral deposit and hold it till conditions for its operations become more favorable is always good business, yet to attempt operations on the same mine while the conditions are still adverse may be the height of folly.

This question of accessibility is one of the most potent physical conditions which may retard successful mining, and millions of dollars have been lost in attempting to set up machinery in distant places, usually because the plans are too ambitious, and the machinery too heavy for the difficulties which must be overcome during the transportation. This, however, is not the only adverse physical condition.

Sometimes machinery requiring an abundant supply of water is sent where water is not under good control, or perhaps cannot be had at all. Particularly is this true of hydraulic mining propositions, where a heavy head, or fall of water is required to be conducted through iron pipes and then directed with great force against the gravel beds, with which the precious metals are found mingled; and, washing down the gravel cause it to be carried by the water through long sluice ways where the gravel is washed off, and the gold dust being of greater specific gravity settles down and when the water has been turned aside, can be collected. A very simple process and if mistakes have not been made in calculating the supply, the fall and the means of controlling the water, profits are almost certain to be obtained. When such a proposition is presented,

the investor should make sure that the supplies of water have been surveyed by competent men and if not, then special inquiries should be made before accepting the venture.

Another physical condition working on adverse influence in hydraulic mining is that the beds may be so situated that there is no convenient place to dispose of the gravel after it has been washed through the sluce boxes. It is a common practice to wash this gravel into water courses, but at some places this is not permitted, at others it cannot be done, and the gravel piling up may soon put an end to mining operations. In some cases the gravel can be elevated and carried off by a heavy head of water which will rise to a level higher than that of the gravel bed; but such, however, is not always available and an investor should see to it that means and places are at hand where, in gravel mining, the accumulations of washed out material can be conveniently disposed of.

In treating ores which must be crushed and ground it happens sometimes that the machinery is not strong enough to reduce the ore to a sufficiently fine powder in order to extract the minerals, a matter which should never be an impediment, but which frequently works great disadvantage in a mining proposition;

and even well known mining engineers have been at fault by not providing machinery of strength sufficient to withstand the strain.

Where ores are to be smelted it often happens that fluxes, that is, material which will help melt the ore, are not at hand, or being at hand the cost and difficulties attending their delivery at the works are such that operations show a loss. A simple matter such as this has many times caused ruin in an enterprise where more careful investigations would have saved the loss of time and money.

Always in every mining proposition there are difficulties which must be overcome before the machinery can be operated with success, and often physical conditions which are of themselves but simple matters have been overlooked. Those which principally work to impede the successful development of a mining proposition have been noted, and an investor of discernment can by making inquiries ascertain whether the physical surroundings are favorable or are adverse, and whether all have been studied and reported on by competent men of good reputation. To pass on the physical surroundings of a mine does not require great skill, the questions are largely practical, relating to means of transportation, easy access for shipment, facilities for maintenance,

supplies of water, abundance of timber, supplies of materials for smelting, the relative position of the ore bodies to the fall of water, where such is required, and the strength of machinery which may be required in treating the ore; and where a competent man has passed on these an investor may be warranted in placing some money in the venture, provided other conditions, the supply of satisfactory ore and the general prospects promise well.

Among the other conditions, political insecurity and surroundings dangerous to health must be considered, though these, strictly speaking, are not physical conditions.

When political insecurity is apparent the organization must be strong enough to protect and defend its own interests. It would be the height of folly to invest in a plan to send a few prospectors to work a rich gold mine surrounded by hostile Indians, though the same place might be successfully operated to great profit by a strong, well equipped expedition. Similarly, a weak enterprise in a country of a semi-barbarous nature, or where the administration is notably corrupt, would hardly commend itself to a judicious investor.

The fact that many regions where valuable ores abound are unhealthy is a serious consideration, and in some such regions mining opera-

tions can be successfully maintained only at great expense. A weak expedition would have no reasonable chance of attaining success. Many times I have seen expeditions set out full of hope, and fairly well equipped, only to meet with disaster. In many instances few of those who went out have returned. Truly Nature guards her treasures with a jealous hand. Difficulties should not deter a person from an effort to secure the treasures, but an investor should risk his money judiciously, and take the hazard only where it is shown that intelligent consideration has been given to the difficulties and suitable preparations made to meet and overcome them. A certain bravado of procedure, and contempt for suggested dangers is usually a forerunner of disaster and a judicious investor would naturally avoid such propositions.

IX

Personnel and Business Organization Required to Attain Success in Mining

Probably the claim that mining is a difficult business will not be disputed. The technicalities where trained skill is required are many, yet though the fact is well-known, men who have no adequate information in regard to the science and profession of mining engineering, are so frequently in charge of mining enterprises that it is well said that any one thinks he can run a mine successfully; a mistake attested by the numerous disasters which following mining ventures.

I have been called on to examine many unsuccessful mining enterprises where I have found doctors of medicine, doctors of divinity, lawyers, journalists, brokers, farmers, army officers, sea captains, in fact men of almost every calling in charge of the enterprises, and it is scarcely worth while to add that the mines were unsuccessful.

One would think that a doctor of medicine

would hardly be calculated to make a success of mining, yet there are many who make the attempt, and I cannot recall one who has been successful. Of the doctors of divinity and plain ordinary ministers there are some, but the "golden rule" does not seem to fit well; perhaps the ministers are too confiding, at any rate they are usually most woefully "stuck," and come out of it with anything but credit. When lawyers leave the work of corporate organization, and financing the enterprise, to take up the physical management of a mining property they are about the easiest proposition a designing operator or mining engineer with machinery to sell can encounter, and the list of failures in mining enterprises managed by lawyers is very long and painful.

A young lawyer was sent to Alaska during the former days of excitement and speculation. He had a good trip, superintended the investment of a million or so of dollars on behalf of a company of such prominence that its name was known throughout the country. The whole scheme was unfortunate, results were not adequate; the man was honest, brilliant, trained in legal technicalities, a splendid lawyer, but the relationship between the expenditures and the compensating results which must be looked for he did not understand. Why should

any one expect that he would obtain results? And as was natural, the enterprise was a failure absolute in total, and the stock is worth not one cent a share today. To multiply illustrations would serve little purpose; one more, however, will be instructive. A young lawyer was sent west during the rougher days of development in that section of the country. He undertook to manage a mine where a tunnel was to open up a large ore deposit. Work was ordered, the young man was made much of, progress was rapid and reports satisfactory. A long tunnel was in construction, nicely but not heavily timbered, paid for at contract prices; and the snow deep on the mountain did not impede the work. But when the springtime came melting snows revealed a lot of collapsing timbers on the mountainside; the miners had simply tunnelled through the snow. Dishonest? Of course it was, but the young lawyer had been stuck, and the money was lost just the same. Dishonesty is so common in mining that only those who have been trained to know when work is proceeding properly can expect to contend successfully against it.

Of all the people who without the necessary training attempt to manage mining enterprises lawyers make the most failures, though some

lawyers do make great successes; but usually they have surrounded themselves with competent, trustworthy engineers, geologists and mine operators.

To enumerate instances would be of little value. The history of enterprises managed by people who do not understand the requirements of the work they have undertaken; who do not know good work, and cannot distinguish it from bad, have but one ending—failure, and so probably it will always be.

Of more use and interest is it to inquire of the successes in mining operation, in order that an investor may seek for similar organizations. One would not care to invest in a bake shop which a shoemaker proposed to set up, and operate; nor in any business which a man without the necessary training was proposing to establish; a carpenter could not operate a tailoring shop, nor could a cook be expected to make successful work of house painting; yet not more out of place than these are some who undertake to manage mining operations.

Surely it is a simple matter of inquiry to ascertain whether those who ask for money with which to operate a mine understand the work which they propose, and common sense should prompt one to seek participation in mining operations with mining men; competent men

trained to the work, and better yet, with those who have made records for success. There are mining engineers who, in a few hours, can obtain almost any sum of money for mining operations, because many people know that they have been successful, and are eager to participate in enterprises which they recommend. This is good practice, and right procedure on the part of an investor; not only to seek investments with those who understand what they are undertaking, but to seek also practical mine operators, for there are many who understand the business, and have followed it as a business, not a technical profession. I refer to people who actually operate mines, not brokers in mining shares, for they rarely know much of actual mining and where they attempt to manage operations in place of speculations, usually make disastrous failures. One can buy stocks through brokers and one should look to his broker for accurate information in regard to the properties whose stocks they handle. Where a broker is a careful student of values, and conditions, his guidance is most valuable, and through dealing with competent, trustworthy brokers many investors have made comfortable fortunes through investments in mining shares. There are, unfortunately, many brokers and agents

handling mining stocks who are not worthy of confidence; so many such, in fact, that mining stocks have become discredited to an extent that they are frequently spoken of as a reproach, when in reality they are the most profitable ventures which one can undertake; the only investments where a small amount of money can make profits which are sometimes a competency for the fortunate possessors. To be successful requires many precautions, not the least of which is to know the people, the reliability of the man who recommends, the capability of the men who propose to operate and something of the business organization.

In all walks of life there are dishonest men, hosts of men are incompetent, the vast majority of all men are failures; why then should mining come in for such severe treatment of public criticism, when there are, perhaps, more successes and greater returns in legitimate mining than in any other enterprise?

Plain business methods should apply, and this introduces the subject of the business organization. It may consist of a well furnished office, a big safe, a stock book and a talkative promoter. Probably there will be prospectuses, maps and numerous samples. An outfit such as this should make one cautious and whenever the flag is put out,

as it were, to catch the eye, the investor should beware. What he should look for is an organization which will be useful to the work proposed, not attractive furnishing to catch the eye; and not to place too much reliance on specimens shown by people on whose statements one cannot thoroughly rely. A story is told of how it happened once in London that a broker in mines had sold a property, and among the samples he had shown was one of great beauty, white quartz studded with gold, a specimen to be desired. The mine had been disposed of, and a friend who had helped in the transaction said to the broker: "Now the mine is sold you do not need the specimen, let me have it for my collection." The broker hesitated, took up the pretty piece of ore, stroked it and then said: "No, you can't have it; this is the third mine I have sold with that sample and I think I need it in my business."

Here is a criterion on business organization: bright specimens and show; if it is to sell the stock it will be in this form; if it is to work the mine it will be in another form; one will be arranged to attract the eye, the other to facilitate work for the mines. Where the object in view is simply to sell the stock, the attractive will predominate; where facilities to work for the mining operations are considered, prac-

tical and often inexpensive equipment will be found. The atmosphere of a place to catch the fancy is so different from that of a place organized to accomplish some practical work that one should not be deceived. If doubt is caused by the surroundings one should inquire what the plans might be for business organization, and should be shown plans such as practical business men would approve. The office, at the financial center, where the mine is being offered, should be good enough to enable those who have the work in charge to exhibit successfully the maps, reports and specimens, and to show the special advantages of the property seeking capital for its operation. They should show what it is costing to raise the money through sale of shares; they should show what work is being done on the property they represent, or what money is being accumulated to provide for work; they should show the names of men on the board of directors who are competent to pass on propositions relating to the practical operation of a mine; they should show suitable arrangements for obtaining their machinery, and competent reports of the requirements which it must fill in order to win money from the ore; they should show their system of accounts, and how they propose to check up the expenditures

with the results obtained; they should show what arrangements are in progress for the organization of the working force at the mines, and the system proposed for checking up the daily expenditures, and accounts; they should show what systems they propose, or have established, for taking care of the mineral which may be obtained; if the proposition is one handling products which must be marketed they should show what arrangements are being made for handling the sales department and finally they should show that they have the services of a competent mining man, or better yet, mining engineer to have charge of the operations at the mine. If on investigation it is found that these particulars of organization are not receiving much attention, then it is pretty evident that they are not thinking of mining, but only of selling stock; and on general principles their proposition is safe to let alone.

It is not fraud only against which an investor must be on his guard. There may be honesty of purpose, yet serious error. "Hell is paved with good intentions"; and it would almost seem that good intentions while following a will-o'-the-wisp were the principal causes for loss in mining securities. But why these hopes and expectations? Why expect so much more

of mining than of any other pursuit? Someone told the enthusiasts and they believed it—that somebody was a designing, perhaps a dishonest, mining engineer or geologist; a man who knew what he was talking about, and who was, because of his technical education, in a position which would command attention. It is a comparatively common saying among many mining engineers of a certain class " get them started, and after their money is in they must put up more to protect what they have previously risked." The engineers and geologists want work, and they overdraw the picture of the profits to be obtained, and underestimate the cost of equipment. The work is started, but in many cases, especially where funds are to be raised by the sale of stock, a critical time comes, more money is called for and it cannot be raised. Then the enterprise goes to smash. This in the opinion of the author is one of the worst features in mining, and the only protection for the investor is to look up the record of the engineer or the geologist. Have his specifications been adequate? If they have not then be careful, no matter how eminently learned the gentleman may be, no matter how important his academic standing.

X

Inquiries Which Should be Made Before Accepting a Mining Venture; How to Make Them

There is scarcely a limit to the inquiries which one could make in regard to a mining proposition; a few, however, are essential, and from these one can form a clear idea of what the opportunities may be. Of one thing a person may be absolutely sure, no mining proposition can be offered which is not worth investigating; and if one but investigates wisely, and selects desirable propositions one will become rich through successful mining investments. Many a proposition will be found lacking in merit and not worthy of an investment, but all are worth investigating, because only by investigation can one find the desirable propositions.

In making the inquiries one should first ascertain what the proposition really is in regard to its present status, that is, at the time when one is asked to embark on the venture. The prospectus will tell of shafts and gal-

leries to be opened, mills which are to be erected, estimates of earnings will be quoted, and dividends to be paid will be mentioned. As a matter of fact the mine may have none of these things, and whether it gets them or not will depend on whether the promoters succeed in selling the shares to provide money to pay for the proposed improvements; and having secured the money there is still a question as to whether the results cited in the prospectus will be attained even after the money has been raised, for all managements are not successful. The first inquiries therefore should relate to what the mine really is at the time of investment. Let the prospective investor make the following inquiries: He should ask to see the original reports which the engineers or geologists have made. In these reports he should find an accurate description of the property, as the geologist found it. If such description is not in the report, then the investor may well decide that the promoters are proceeding without definite information, and are therefore showing indications either of incapability or dishonesty, and the investor can let the proposition alone.

He should next inquire what actual money has been expended, first in the acquisition of the property, and after that in the improve-

ments which have been made. His next step should be to compare the reported cost of, and the improvements on the property under his consideration with the cost of similar properties and improvements which have been made on successful mines. Usually the figures can be had by getting the annual reports from several different mining companies which are successful, and comparing the costs and results at these properties with the costs and results at the mine in which he is asked to invest. If it is seen that the proposition he is considering is being operated at a much greater cost than were the successful mines, then it is evident that mismanagement is indicated, and he should not invest, because no matter how good a mine may be, if it is mismanaged it will not be profitable for the stockholders. In making investigation for efficiency the investigator must remember that a new proposition can never be on as good a working basis as a well organized and established property, but if there is a very great discrepancy then the new proposition is not being operated to reasonable efficiency and should be let alone.

Having found what the actual state of the property is, the next inquiry should be what is the property actually worth in money, not

prospects. This actual worth is often difficult to ascertain, but in every mining country there are bankers, brokers and dealers in mining property; and one can write to some person situated near the mine in question to ascertain at what rates mining property can be purchased. If one is considering a mining investment, it is worth while to write such letters, because by this means one may very often hear of really desirable propositions to be had at low rates, or rather, at fair rates; because mining property if it is good for anything is costly. Having ascertained approximately what the worth of similar property may be, one can make an estimate of the actual worth of the proposition in which he is asked to invest. This actual worth divided by the number of shares in the proposition gives the actual worth per share. This represents the actual present worth, but the shares must be of greater value, the prospect must be good and worth something, else the shares would not be worth buying. To calculate what is being paid for the prospect, the chance of making a big profit, take the actual worth of a share and subtract it from the price at which they are offered. Now we have the question—is the prospect worth the amount represented by the difference—the most difficult question in mining,

for it deals with speculative quantities, and conditions which can be estimated but not surely known. To proceed in estimating what the chances are one must compare the proposition offered with the early conditions which were found in successful mines and properties which have turned out winners to the great profit of their owners. To obtain this information one can visit the public libraries, and look back among the old files of the mining journals of the dates corresponding to the period of the first history of any great mine; and there pretty certainly will be found accurate descriptions and published reports, or, if these are inaccessible, one can send a subscription to one of the better class mining papers, and ask for information as to the early history of some two or three mines which he would like to compare in their earlier or prospective stages with the property in which he is asked to invest. He should seek the technical mining papers for his information; the mining press which deals with questions of investment values has, up to the present time, been of but little service. The technical papers are managed by men skilled in the technicalities of mining, and will have the best authorities on mining among their contributors; and any information which may be had from them will

be worthy of careful thought and consideration. They will treat, however, only of technical subjects in their relations to mining; in regard to investment or speculative values they will have very little information. Such points the investor must decide for himself. If he has good judgment in selecting mining investments he can make a fortune, but if after four or five trials he finds that his judgment has not been good then he had better seek some other field of industry for his ventures. When one has received the information in regard to the early history of great mines it will be found, in the majority of cases, that the properties have been great from the start, that the exposures of ore have been large and have attracted wide attention. One will find, on the other hand, that in only a few instances have inferior showings of mineral led to great mines, though there are some notable exceptions. One may judge and be warranted in the opinion that where there are great ore exposures the prospective value is worth a considerable amount of money, and in some instances may warrant a very high price for the shares, much more than the total of actual values existing before development. If it is a medium exposure of ore, and expectations are entertained that on opening the property greater values

would develop, the prospective value is worth something more than the actual selling values at the time this stock is offered. Especially is this true if the ore exposures are of a quality which will pay for mining, and treatment to extract the metals; but if the ore exposures are of poor quality, not sufficiently valuable to pay for the working and milling; or if there are only inferior amounts exposed though the quality may be good, and the mine to pay must find larger ore deposits, the stock is worth very little more than the actual selling value for the property, and if there is no selling or actual value then the stock may be considered worthless, though one might give a few cents a share for the chance that something valuable might be found, especially if the speculation is in the hands of capable people.

In making these investigations one must trust very much to others. Investing money is intrusting it to others who will use it and pay for the privilege; and as some can be trusted, and some cannot, and as some are successful and some are not, an investor who would make money on his investments must find men who combine the two qualities; they must be trustworthy and they must be successful in the line of enterprise for which they solicit the co-operation of capital. In mining

one will secure better returns with the right kind of people than in any other line of business; however, doctors of medicine who have not secured a practice, lawyers without briefs, ministers without charges and business men who have been unsuccessful in other operations are not more apt to be successful at mining than they have been in their previous callings; and however honest they may be it is not honesty alone, but profits for the use of money which the investor wants. The most important part of the investigation to an investor is the investigation of the people to whom his money is to be intrusted, because if the people are reliable and successful one can be pretty safe in taking a chance with them; and if they are of doubtful record or if they have not been successful one had best let the proposition go and look for something better.

In making the investigation of people one can proceed with some assurance that the information can be promptly and accurately obtained.

If a person has money to invest it is natural that he should have a bank account, and his first step in making an investigation should be a request to his bank to write the bank nearest the place where the mine is situated and ascertain what the local credit and

standing may be for the enterprise under consideration. This will give him an idea of the credit of the parties, and the property. The opinions which may be given by the bank officers as to the advisability of investing in the mine are of little value, for bank officers know nothing of mining, and have persuaded many people to turn away from mining propositions, which have made fortunes for others who had assumed the risk. Mining is a risk and a speculation, and as such has no part in banking; the bank officers deal in loans, and credits, and are supposed to know the standing of people and enterprises in the communities about them; a letter from one bank to another making inquiries is pretty sure to be promptly and accurately answered, and the investor will learn that the proposition he is considering is of good, fair, indifferent or questionable local reputation; and can to that extent ascertain whether the managers are to be trusted with his money.

Let him next take the names of all the officers, including the directors of the enterprise, and in the same way have his bank write local banks where these people may reside, and find out what their local reputation may be worth.

Next he should ascertain which one, or more, among the officers represent the active pro-

moting interest in the enterprise. Let him then take these names and the name of the company, and get a commercial credit report on them from some one of the great rating agencies, asking for information in regard to both the people and the enterprise; this will give their general credit and reputation; but the mercantile rating agencies are often mistaken, most grievously mistaken, and many worthy people suffer because of statements which they make. Two instances will illustrate. I have certain knowledge of an inquiry which was made of a very prominent mercantile rating agency. The report stated that the parties were unknown, had no credit and no commercial standing. The people were not rich but they were prospering in a small way, and were so honest and reliable that one might intrust them with anything he had. In another instance the same agency reported forty thousand dollars assets, a flourishing cash business and nothing known against the reputation for a man who, at the time the report was made, was a confirmed drunkard, paying no one where he could get out of it and with a personal standing which was almost disreputable. These instances show that the mercantile rating agencies are not always reliable, but while they make mistakes at times, their in-

formation is always to be sought, and in the great majority of cases is accurate and valuable; but one cannot rely on the rating agencies entirely, because they would probably give a most adverse report against a poor but honest miner, who might have a property in his control out of which he could make a fortune for himself, and others, if only they would intrust a little money to him.

Having obtained all the information possible in regard to the people who are presenting a mining enterprise, the next line of inquiry should be in regard to the economic geologist, metallurgist or mining engineer who had examined and reported on the property. He recommends it, otherwise the promoters would not publish his report. Probably the company's officers will supply the record from which the investor can make his own inquiries —these should be to ascertain what the person may know, where he attained the information, where and to what extent he has studied, what scientific societies have given him recognition and what enterprises he has served in a capacity similar to the capacity in which he is serving the enterprise which seeks the investor's money. Inquiries to the scientific and technical societies with which he may be connected, his former employers, and the

people with whom the gentleman may have had relations will show his character, standing and abilities; and give the investor an idea as to what his recommendations, and opinions may be worth.

Here certainly is a lot of work recommended to the investor who may think of taking a venture in a mine, but nothing of success can be had without work. One can make a fortune through successful mining investments, but if one simply wants to take a chance, and will invest haphazard through reading an advertisement, or an unconfirmed prospectus, returns can be expected only if one is lucky; and when it comes to playing on one's luck it is just as well to visit the gambling table and have some fun at the game, for money is just about as sure to be lost at haphazard mining investments as it is at gambling.

XI

Conditions Under Which a Mining Proposition May be Accepted

Let us suppose that an investor has decided that it is worth while to undertake operations in mining stocks, and has made a series of investigations, and has the facts from which to decide for or against a proposition; and has now to debate the situation, to decide whether or not he shall risk the money. Naturally the conclusion has been reached that there is nothing in mining which can be considered sure, yet the chances of gain are frequently such that one should intelligently place a certain amount of one's savings, or property, at hazard. It is not an investment, it is simply placing some money for a great winning in a proposition where one's intelligence is able to indicate what the chances of a favorable result may be; and the better chances predominating, one is justified in accepting the risk. Where conditions are favorable one should have found that the investigations confirm the claims made in the prospectus; that is, disinterested

people have written him of the property, particularly people living near it, in a great measure confirming what has been claimed in the prospectus. Probably the reports will not coincide exactly, two different statements never are exactly alike, but if the principal features have general similarity this is a very strong condition in favor of the proposition.

Through his bank the investor will have heard that the general standing of the people connected with the enterprise is good, and that many people think well of the proposition, particularly among those who are in a position to come in direct touch with it. The report may be that the people are of good local standing, but that the bank officers know nothing about the mining proposition; such a report can be considered as favorable, as the bank can at best only tell of local credit, and may be greatly misinformed in matters of technical valuations.

The reports on the property under advisement will be shown on inquiry to have been prepared by a man who bears a good reputation, and who has the technical skill, and the information gained from a good source which enables him to write with the authority of one who knows his subject. A report from a man who has had the technical and scientific train-

ing, and who had later had actual and varied experience, so that he can speak from technical knowledge, and practical experience, is the most valuable. When this favorable condition has been found one can take the report and believe it; and if the mine promises well the report should be considered to be sufficient warrant for an investment. Those who place money at hazard pay too little attention to the report of a competent engineer and should insist that such a report be submitted for consideration before taking any risk in the proposition. If this were done and the records of those who make reports more carefully looked up, there would be very little money lost in mining. I do not wish to say that a man who has not been through a university, but has attained his knowledge in the School of Hard Experience, cannot make a report on a mining proposition; frequently the reports from such men are the most valuable; I do say, however, that if a man of experience has the ability to pass judgment on a mining property, and make a report on it which may be accepted with confidence, that man will have a record to which he can refer, and many people will speak well of his ability; and if his record does not attest the value of his work, then his report should not be accepted; and it is my opinion that a

man who has simply been at mining for a considerable period is not competent to make a report on a mining proposition. It is requisite that a man should have been a careful student, and should have had opportunities to examine many different mining propositions before he can report successfully. We are considering favorable conditions, and the reports coming to the investor will be that the examination of the property has been made by a person worthy of confidence, both as to his integrity and his skill; and this being the case it is fair to put the proposition down as a good thing.

Then the final matter of investigation, the questions as to whether the people offering the property, or rather who are asking for the use of money, are reliable and have the ability to obtain results. There is many a good mine gone wrong because the management was incapable or dishonest, and the investor should here exercise great care in his investigations. If the personal credit and standing of the people with whom he is to intrust his money is good locally, in the places where they live, and if they have a good financial standing, are considered good business men and have placed some of their own money in the enterprise in which he is asked to take a risk; then, if it is shown by the investigations,

that these people know what they are talking about, and have been in mining as a business; or, at least, that some of those who are managing the proposition do know mining and have made money at it, then the supposition is fair that they will be able to make still more money, and they being found both honest and capable one may expect to make money with them.

All these considerations being favorable one is ready to take the investment, and it is only a question of the price which he should pay for the stock. It is supposed that the property is free from debt and the title held clear for the stockholders, unencumbered by liens, conditions, mortgages or obligations to be performed; because where these are found a strong element exists against the chances for success, and if the proposition is accepted with such incumbrances the price paid for the stock must be much lower than would be paid in a free and clear proposition. Still if the other conditions are favorable, a good local credit, a good report on the property made by a competent man; and the proposition being in the hands of honest, capable and experienced people, it certainly is favorable to take a chance with them, and the only question to consider is that of price. The investor will have made

a calculation of the present worth, that is the actual value of the property for cash, and will have compared it with the prices asked for similar property. He will have seen how the present condition of the proposition compares with the former conditions of other companies when they were being promoted, and he will have decided whether the price asked for the shares beyond the actual cash, or present worth value of the property, is too much to pay for the prospective values, and the expectations. This difference is to be put into work in the property, and will improve its value, naturally so; and the proposition being in honest, capable hands, with experienced people as managers, the expectation is reasonable that it will be well expended, and that the investor will obtain the benefit. But how much is he to make? That the money he is placing will benefit the property is plain enough, but if it benefits it only to such an extent that the investor simply has the value of his money, then there is no profit, and one goes into mining for profits. To double one's money should be very ordinary, to make five hundred or even a thousand per cent. on mining risks carefully considered should not be rare. If it is found by the investor that the expenditure of his money on the property is probably to im-

prove it so that he will obtain at least an indicated profit of one hundred per cent. with probabilities that it will be even more, then the proposition is a fair one, and he can put his money in against the work which has been done in acquiring the property, and the chances are decidedly in his favor. Naturally it is so, for if the proposition is found to have a good local credit; to have been reported on favorably by a competent, experienced man; to be in the hands of honorable, capable, experienced and trustworthy people, who understand the business; and if the price asked is one which admits of large profits then, where is the risk? In truth there isn't any, but the price of selecting such a good investment is that one should take the time and trouble to make the investigations. The reward will be a share of the great wealth made in mining, because the investor will, if he exercises caution and good judgment, be certain to obtain a share in good propositions. One must do the work of making the investigations, however, and accept only facts, not hearsay evidence, in coming to a decision.

Accepting evidence which is not well authenticated causes many losses. To give a neighbor a good word of encouragement is natural even in the case of a mining proposi-

tion. It is well to be kindly but money is a precious thing, grievous to lose and financial recommendations should be given with caution. Many people speak without due consideration and it behooves an investor to consider those who recommend as well as the enterprise recommended. Boards of trade and merchants may be interested in anticipated sales, prominent politicians must speak a good word for all their constituents, clergymen are naturally friendly and neighbors are usually neighborly. Such services may or may not be reliable. Especially undesirable are the so-called financial journals usually edited by irresponsible people, or by people of bad record, who for a small sum annually offer a semi-insurance against loss through the correspondence bureaus. Such journals are known by the character of their reading matter—editorials against dishonesty and violent personal attacks on individuals or enterprises. Desirable sources of information are reputable publications where character and worth are indicated by the dignity of their pages and their freedom from personal abuse; so are credit agencies, mining engineers and geologists of known reputation, banks, bankers and in some cases lawyers. It is best to have information from such sources as these even if the investor has to pay a moderate fee in order to obtain it.

XII

Conditions Under Which a Mining Proposition Should be Rejected

One can reject a mining proposition in short order, and one short chapter is sufficient to indicate conditions, any of which should be warrant enough for declining to take an interest in such a proposition. The investor would probably find a means for making inquiries through his bank as recommended, and would first learn of the local standing of the proposition, and the men connected with it. If word comes back that the proposition has a bad, or questionable reputation, and the people connected with it are not held in respect among their neighbors, it will be very safe to let the matter entirely alone, and refuse to invest at any price, no matter what inducements may be offered.

Another condition which would be sufficient to warrant one in declining absolutely to have anything to do with an enterprise is, where the prospectus, and published reports, do not agree with other accounts of the property which may

be had from parties living near it. Of course no two accounts will agree exactly, but if there is a decided discrepancy, and the reports offered by the parties interested in the promotion are very much better than any one else will be willing to say for the property, exaggerated and misleading statements can be suspected, and the trustworthiness of the whole proposition placed in doubt, and one had better be careful and have nothing to do with it.

If it is found on investigation that the property is not free and clear, but is incumbered with debts, liens and contingent clauses affecting the title; conditions which have not been clearly stated in the prospectus, then fraud may be suspected, and certainly one would not want such an investment.

If it is found on receiving the reports from the mercantile agencies that the people offering the stock have been connected with questionable enterprises, or are not of good business reputation, then the danger flag has been found and should deter any one from making an investment.

The other conditions under which a proposition should be rejected are not so clear and will very much depend on the personal opinion of the investor. He must form his own judgment as to the condition of the property

when he is asked to invest, and how it compares with the conditions which were found to have been reported in regard to mines which have turned out well, but which were, of course, once in their prospect stages of development. Here one must exercise judgment, and must read the accounts and reports of mines which have turned out well, and judge what the prospect may be for the mine in which he may be asked to invest. In this the investor must rely very much on others, and must look up the record of the man who makes the reports recommending the property. If it is found that he has reported on properties which have turned out badly, after he had recommended them; if it is found that he is a man of questionable reputation; if it is found that he is not a disinterested party, but owns part or all of the property he recommends, and his recommendation is not confirmed by others; and if it is found that he had not had the advantages of special training, or wide experience in mining property, it will be safer not to risk money in the venture; especially if the proposition is one where ore is not much in evidence but it is hoped and expected that mining operations will open up mineral deposits which will be valuable.

Most mines are failures because a mistake

has been made, or expectations have not been realized in regard to the supplies of ore; and unless the proposition makes a very good showing and has been reported on favorably by qualified men the chances of losing are much greater than are the chances of making a profit.

All mines go through a struggle to find machinery which will treat the ores successfully, and often years are occupied and hundreds of thousands of dollars expended before a suitable plant can be constructed, and profits made; this period of disappointment during the development must be expected and is not a reason for turning away from the enterprise. If, however, the investor finds that tendency of the management is to hurry the equipment before they have opened the property, and know how much ore they have available, it is well to remember that undue haste leads to disaster in mining. As most mining propositions are failures, one must remember and study the circumstances which have brought about these failures, and form his judgment as to whether the risk shall be accepted or rejected. Of the propositions offered, certainly the great majority are to be rejected. Of course one wants nothing to do with enterprises which are simply to sell stock and one can detect

these as noted in a previous chapter, and naturally will let them alone; still this may not be an important part of the investigation, because a scheme to sell stock in a property not worthy of the investment will only be proposed by dishonest people, and the bank reports, with commercial agency statements, will give the necessary information and enable one to avoid dishonest propositions.

Then, finally, the question as to the price asked for the shares must be considered. The best mine in the world might be undesirable if the price placed on the shares were one which would not give a fair mining profit to the investor, and a mining profit is a very large profit; such shares should not be purchased. These are usually put in the public markets, and the prices advanced up, and up, to attract buyers; but the investor should consider only values and multiply the number of shares in the whole mining company by the price quoted per share, and then consider whether the mine is worth that much, and if the price seems excessive let the proposition alone.

Similarly, having deducted the estimated present worth, or real salable values from the shares, as per the formula previously stated, and having found the difference which is the price asked for the prospective values; and if this is

found to be more than the situation warrants, or is greater than the rate generally quoted for other mining properties, it is better not to take the proposition, because where one pays too much one is not likely to obtain a due profit.

As to investing in companies managed by doctors of medicine, ministers and others, usually it is best not to do so, but there are often exceptions, especially where the manager has been shrewd enough to surround himself with competent, reliable men.

Finally, where anything looks doubtful and the statements are not clear, and businesslike, and the managers take offense and object to a careful investigation when it is proposed; it is better not to go into the deal with them, because most mines are failures anyway and it is only by selecting the very best that one can expect to make money.

In these chapters nothing is said about dividend paying mines, because one is not solicited to invest in such property. Established companies rarely issue a prospectus, and the speculative, the big profits in mining are made by getting in on the new propositions which are desirable but cheap because in their initial stages of development.

The two propositions—investment in estab-

lished mines and investment in new speculations—are so different that they must be treated separately.

Before considering dividend paying mining stocks and their special features, it would be perhaps fitting to state in this chapter that in one respect such property must be considered on exactly the same basis as the non dividend paying stocks. The influence of a management endeavoring to take advantage of their inside information to benefit themselves may be equally disastrous to those who invest, both in dividend and non dividend paying stocks, with the greater risk that in the case of dividend paying stocks the price is always higher and more money is usually at stake. There is no reason why a dividend paying stock should not be as carefully scrutinized in regard to the management as a non dividend paying stock, and where men are found who are not trustworthy, it is best to let them keep the stocks for themselves, no matter how attractive they may make the market in developing activity of speculation. Examples of disastrous results for dividend paying mining stocks are not wanting. Almost every year some such case is developed. Not so long ago a well-known copper stock was selling well toward the one hundred dollar per share quotation. The man-

agement was brilliant but speculative in its own interest, and to-day the stock is selling at but little more than a dollar per share, to the great loss and injury of those who bought at the high prices. A silver stock was made popular in the public market, and sold well up into dollars per share under speculative manipulation. Now it is down to a few cents a share, and has a poor standing even among the non dividend paying stocks.

Brokers are wrong when they advise their customers that if they buy dividend paying mining stocks enjoying a public market the risks of mining will be eliminated. Dividend paying mining stocks are good if they are cheap enough, but usually they sell for more than they are worth, and no matter what the price they are subject to the same dangers in the management as non dividend paying stocks, and should be scrutinized with the same care.

XIII

Investments in Dividend Paying Mining Stocks

When one considers an investment in dividend-paying mining stocks it is usually all a question of price; not entirely so, however, because it sometimes happens that widely advertised offerings of dividend-paying mining stocks turn out to be the worst kind of swindles; the dividend, so called, being simply repayments of a small proportion of the money received from the sale of stock. This is a thoroughly dishonest practice and one distinctly forbidden by the law; it is done, however, and there are many subterfuges to hide the real character of the payment. A common form is for the promoters to make transactions among themselves which will show a paper profit and then declare a dividend, but in reality pay it only to a portion of the stock, that is to a few shares which they may have sold; the amount required is not large, because only a few shares have been disposed of and the stock which they hold really receives no dividend, the promoters

sign a receipt for it, and to all appearance it has been paid. On the strength of this dividend the stock becomes salable, and presently when the promoters have sold what they consider sufficient, the stock is left to shift for itself and no more dividends are paid. Under one form or another, with better or more crude concealment and manipulation, this game is being frequently worked, and many are defrauded by it. The means by which an investor can protect himself are very simple. If a property is really earning dividends active operations must be in progress at the mines, and accounts of sales of ore will be in evidence; or returns from bullion, metal or mineral sales will be at hand and there will be some system of bookkeeping. A company honestly managed should make no objection to submitting proofs that its dividends are really earned, and where objection is made one can refrain from investing. The same care should be taken in looking up the standing of officers and of the enterprise itself, as would be taken if it were an untried speculative venture; and where it is found that the enterprise is in the hands of questionable people it should be let alone, no matter how much may be paid in dividends, no matter how active the stock may be in the public markets; such activity is no criterion of real conditions, and may be entirely

the outcome of clever manipulations on the part of the promoters. There is just one thing for an investor to do in relation to a proposition found in the hands of people of questionable reputation, and that is, let it alone.

When it is found, however, that a property is really in operation, and is earning dividends, then it may be a very attractive proposition for an investment, but it is all in the price. A mining stock should pay a high rate of dividend, because if an investor does not get his money back, and a profit out of the dividends, the investment is a loss to him. The reason is that all mines must come to an end some time, even the greatest, and when the end has been reached, and all the ore taken out, the mine is worthless. The question is, how long can the mine keep on paying dividends, and how far away is the period when it will be worked out and worthless? The world is full of worked out mines, and as all must come to an end the investor should consider the end, not the present of a mining investment.

If a stock is bought at a price which will net the investor twenty per cent. a year in dividends, the rate would certainly look attractive. But the rate of dividend alone is not sufficient to warrant an investment, one must be reasonably sure that the mine contains mineral

enough to keep the dividend payments going for a period sufficiently long to return the money invested and yield a profit. At twenty per cent. per annum one's money will be returned in five years, at ten per cent. per annum one's money will be returned in ten years, and at five per cent. per annum the money will have to remain out for twenty years before there is any profit, and only a few mines have paid for so long a period.

It seems reasonable that a stock in an ordinary mine paying a net return of only five per cent. is selling too high, but that when the rate is between ten per cent. and twenty per cent. the proposition is more attractive, and more nearly on a normal basis of compensation for the risk involved.

Dividend-paying stocks are usually not offered for public subscription, and most of them have regular quotations in the stock markets at which an investor can either buy or sell, and with such stocks the opportunities for speculation are very attractive. The markets for such shares are rarely very broad, and they are for this reason extremely sensitive to changes of market conditions, and their fluctuations are frequently in a wide range. In making speculative purchases of mining stocks in the open markets one should be governed,

not by the fluctuations, so much as by the estimate he may have placed on the actual worth of the property. If one will do the work, and make the investigations which will give the true conditions at the properties he may think worthy of attention, and then having obtained the facts compare the prices for the shares with the average prices of similar propositions, and having determined the worth, the investor is in a position to buy whenever the prices are below the worth which he may have estimated, and sell when the price is greater than the worth, but always it must be remembered that to put money in any mining proposition where the management is not thoroughly reliable and capable is to place it at a double risk, where the odds are too much against the investor.

Where a speculation develops in a mining stock, and it begins to assume activity, and move up to better levels day by day, one can suspect manipulation; such has been seen recently in several stocks, and one should pay no attention to it. By all the signs some one is out to unload stock on careless investors, and presently those who have engineered the manipulation will withdraw from the market, and go about with a broad smile, and sneer for the credulous, telling how they have made a killing. It is the same old story of the faker

at a country fair selling watches, only in a different form. The faker offered watches at 50 cents each, saying that the next day he would sell the same watches for a dollar and take back any he had sold for fifty cents at the price of the day, one dollar. The next day the watches were offered for a dollar, and anyone who had bought at fifty cents could get a dollar for his watch. The business being completed the faker then offered watches, as many as people wanted, at one dollar each, saying that next day he would sell at two dollars and take back watches at the same rate. This he did and then announced that next day he would sell at four dollars and pay four dollars for any watches he had sold, and people bought freely at two dollars. When the next day came the faker kept his word, took back the watches at four dollars, and then announced that he would sell as many as people wanted to buy at four dollars, and if they were not satisfied, take them back at his selling price for the next day, which would be eight dollars. He assured the people that his only object was to advertise the watches, the manufacturers knowing that on account of the superior quality of the watches they would by this simple means of making the people handle them, and see their merits, secure the good will of the

neighborhood and a permanent trade. It was a plausible story and the people bought in great numbers at four dollars each. That night the faker packed his grip and went away, leaving the people stacked up with dollar watches for which they had paid four dollars. The support had been withdrawn from the market, just as it is in fact, though in a different form, withdrawn from the stock market when the manipulator has sold out at a price satisfactory to himself, after spreading the report that he would presently be selling at a higher price, and would take back any stock which might be offered at the higher figure. In one form or another this game is constantly being played in the open stock market, often so cleverly adjusted and concealed that the manipulation looks even to the best informed like a real development of values, but the result is always the same, the manipulators finally obtain a killing, and having secured a large price leave the purchasers to their fate, and the market becomes unsteady, flounders to lower quotations, in some cases goes out of sight altogether, and the stocks become unsalable.

In mining stock operations there is just one thing to study and that is actual values; on any other basis than buying when the prices are depressed below actual values, and selling

when they advance above them, one will certainly be left in the lurch. The skill is in determining what the actual values are, and to do this one must make a careful study of all the information available.

In considering such information the investor must not be misled by preferred mining stocks. A preference for a limited interest to a small number of shares, with a similar interest to a large number of common shares after which both kinds are to share alike simply means that the bulk of the product will go to the common stock. The preferred may have its interest but cannot have a profit till large payments have been made to the common stock, and unless the preferred has full preference and then shares equally in all earnings with the common stock the word preferred is a misnomer and fraud would be a better word to designate its position.

XIV

The Spirit of Adventure and Speculation. What Some Have Gained and What Others Have Lost

Luxurious in the metropolis lives a man with everything his whim or fancy can desire, if only the purchasing power of money can obtain it. Riches are his, gained from the mines, and fair fortune smiles upon his happy life. On the western plains is a human skull, bleached, and white in the sun; ghastly in the pale light of the moon; a toad has made his refuge in it secure in the silence of the desert, and it is nothing; the man lost his all, and his life was a sacrifice to fortune, he sought for mines and had no reward. These are the extremes, the prize to one, the penalty to the other. Who goes a searching after mines? The spirit of adventure and speculation stirs always in the human soul, desire, triumph and achievement; or desire, hardships and failure—perhaps death; one is the penalty, the other the reward. Is it worth while? Perhaps, at any

rate men will always take the risk, that is some men; and when an excited prospector presents himself before those who might take a chance with him in the property he has found, or thinks he has found, is it a great thing that one should risk a little money to test a property, which may have been obtained after years of hardship, exposure and danger. My belief is that where a miner who has done honest work, has really searched and prospected, and can show a record which would entitle him to confidence, and presents himself to people with capital, saying that at last he has found a prize, then his story should have ready listeners, and it ought not to be so hard for him to secure the money to prove up what he has found. To take a chance at first hands with those who prospect for mines is a most attractive form of speculation, that is, where the prospector has succeeded in finding something which promises to develop values. To grub stake a prospector, meaning to give him the supplies which will permit of explorations to find mineral deposits, is playing simply on a chance, and may or may not be good business; but where the prospector has found a mine it is a very different proposition, and one might well take the risk.

To tell of great individual fortunes which

have been made at mining is not of interest to our subject, we are treating of that which an investor could do and what he should do in the spirit of adventure and speculation, to risk a little for gains in volume. Only one must risk with judgment, but a risk one must take if one would share in the hidden wealth of mining regions.

In considering what some have gained, the copper deposits of Michigan may have a prominent place in one's thoughts, for there are the accounts of how hunters and adventurers, years ago, brought back stories of great exposure of pure copper; some said mountains of pure metal exposed in the forest lands of the little known northern peninsula of Michigan. Occasionally people gave heed to these stories, most held them in derision, but those who gave heed sent and secured the properties. Then came the struggle to obtain funds and it is said that stock in the great Calumet and Hecla mine went begging for purchasers at but a fraction of its par. It was a struggle of some years, but in the end those who had ventured were triumphant; and rumor, on well founded information, has it, that some of those who were first to take the risk have had a competence for themselves and for their children out of small amounts invested in Michigan. Surely

a good compensation for the risk. Not only the Calumet and Hecla but other great mines were developed. Then when some had secured the prizes a speculation developed; great was Michigan, copper was reported to be everywhere, and copper companies, exploration syndicates and mining enterprises sprang up in numbers; people bought, and speculation ran a turbulent course; but the cream had been secured, most of the latter propositions had no value and they who went a trailing after where others had been first, lost money, and some were ruined.

This is a condition which should be emphasized in one's thoughts; the money is in the new discoveries, the big money; the rare returns which give a competency for a small investment put at risk. Always it has transpired that where a great discovery is made a swarm of speculative enterprises follow after, the promoters stating that their mines are just adjoining, or just in line with, some well known important proposition and mining discovery. Wherever there is a great mine the country all about it will show indications of mineral; these in most instances do not lead to new mines, but simply point to the great mine which has been discovered. The district naturally has fame because some two or three, per-

haps more, mining companies have occupied it and are making great strides at uncovering rich ores; the press is filled with accounts of their great doings, the well advertised situation is such that any property in the famous district can find purchasers for shares; the mines offered are just next to, or near the great discoveries, what an opportunity! Thousands of late comers purchase, and lose their money. There is little use in trailing after a great discovery, better get in on the great discovery itself, even at an excessive price, than to risk money on cheap trailers; but the conservative thing to do is to recognize that the discovery has been made and that others have it; then keep on the watch for announcements of new fields, and when such are first brought forward be quick to investigate, and if the outlook promises well, and is in honest hands, be among those who get in first.

This condition of profit to the first comers and losses for all who follow after is illustrated in so many places that one can consider it a fact almost beyond dispute that profits are only for the early comers, generally speaking, of course, but in most cases it is a fact; and, naturally, those who get in first obtain the pick of anything the district may afford. In this there are many illustrations. A great excite-

ment was developed when gold was given prominence in California, and millions upon millions were made by those who had the first propositions in the different mining districts; and since then millions upon millions have been lost by others following where the first successes had been made. California is a great state and new mining districts will probably be discovered and then the history will be repeated; good luck to those who get in first.

Later came the discoveries of oil in Pennsylvania with millions made, and then millions lost by late investors.

Then came the southern coal and iron lands with the same results, the iron discoveries in Michigan, the mining regions of Colorado, the copper zone in Montana, the great copper belt in Arizona and New Mexico, the excitement following the discovery of gold in Alaska, and the lives of thousands lost in trailing after those who had the prizes. Today we are having the splendid developments in Nevada, where some few great mines have made, and are making fortunes for the possessors, while hundreds of trailers are yapping out their wares and millions are being lost in expectations based on a supposition that mineral formations are of such great extent that all the numerous companies must have valuable propo-

sitions. The same situation has developed in Canada, and will probably develop in relation to Mexican mines where some remarkable developments are taking place. History will repeat itself, a few great mines will be found to have enormous value, and those who have invested in the second rate propositions will find their ventures resulting in a series of grievous losses.

Whatever the spirit of adventure and speculation may move one to attempt, one should remember that those who have made money in any district have been in on the main ledge, the principal deposits, and that is the place where one should have investments if one expects to make money in mining.

The question naturally follows: what is the main ledge, and how shall it be known? So far as speculation is concerned the stock representing the main ledge is usually the leader but at times the allurements of the market leaders, manipulated to high prices, may bring serious disaster to the confiding purchaser. The advice to get in on the main ledge should be modified by the admonition—do it at the right time—and the right time is when the stock is still low and while there is something yet to be developed. Usually it will be found that the principal ore zones of a region

have definite characteristics with a trend of formation, and a succession of limitations in an irregular, but pronounced sequence. The blanks just near to, just in line with or as apparent extensions of ore bodies rarely develop anything but disaster.

It should be remembered that when a new mining region is discovered, the whole, or the choicest portions can be obtained by making the locations. Those who know enough to discover a mining region usually know enough to locate the main ledges; and a big mine can be located in a surprisingly small amount of ground. It is the approximations that spread out all over the region. As an illustration remember how much money could have been made by purchases of the Nevadas, the Cobalts and other new mining stocks when they first appeared, and the newspapers were calling them fakes; then remember how much money was lost buying on the boom, when all the newspapers were telling of wonders and riches, which they knew nothing about, as events have demonstrated. Get in on the main ledges but get in at the right time, and beware of a boom, then it is time to sell, not to buy.

XV

The Prospector and His Agent, Honest and Dishonest Work Compared

Will he secure the benefits of his discovery? So many have located mines and then lost them through dishonest agents, that naturally the prospector is suspicious. Here is a point which one can consider when a mining venture is under advisement: If the agent in charge of the negotiations is a man who has the confidence of the miners and prospectors he is pretty certainly a man who can be trusted by anybody.

This chapter is to tell not so much of the relations of investors and agents, as to show how all the losses in mining do not fall on those who supply the money for operations.

The mine agent or broker is always scheming, honestly or dishonestly; he has a purpose to accomplish, he seeks to obtain control of a mine which has been discovered, and so manipulates the arrangements for incorporation that he may benefit in a share of the

property, and at the same time put it in a position from which capital can be obtained for its operation. When this is honestly done any profit which the agent or promoter may obtain is well deserved; but where the work is not fairly rendered, where the control of the property is secured by questionable representation, and promises which the promoter cannot fulfill, then the shares obtained are illy gotten; but unfortunately the laws are such that it is as difficult to punish such transgressions as it is to obtain judgment against one who has sold and misrepresented shares. In some instances a clear case is shown, but most frequently the undertakings turn out to be only that due effort should be made, and a positive engagement is not found; and by due effort anything may be intended; so the case is hard to reach, and the prospector who has found a mine must be careful. Unfortunately, watchfulness, intelligently exercised, is as rare among those who have found mines, as caution and serious effort at investigation is rare among those who invest in mining shares, and the promoters are the principal causes of all the difficulties.

Our prospector having secured his papers, and having finished enough work on his claims to hold them for a year, must look for larger capital to put them on a strong working basis.

He does not have to look far to obtain agents; the fame of his discovery has gone abroad and he is fortunate in being able to pick and choose. Having found a satisfactory man, a clear contract is drawn, the rights of the prospector in the share of the mine which he will keep for himself, the share he will allow for the capital, and the percentage he is willing to pay the agent, are all clearly designated; the titles are then deposited to protect the transaction, and after that a company is formed, and generally good results are obtained, not only for the prospector, but for those who purchase shares; and under careful just management another is added to the long list of brilliant and successful mining enterprises.

It is very pleasant to find such instances, but unfortunately all are not so, and many a promoter is responsible for ruin and loss where better results might have been obtained. Not all prospectors are so successful as to find a mine which is great enough to command attention. There are many properties, and mineral deposits; and oftentimes the owners must make all sacrifices to obtain the necessary funds, but there is such doubt attached to a prospector's story that often years pass before a man who has discovered a mine can obtain a hearing, and naturally the mine agent can

make his own terms; if only he will render the services, he can have the mine on deferred payments, that is, stake the mine and control it for purposes of organization and promotion, paying himself after the work is done.

Usually a man who has discovered a mine can in a little while find someone to undertake its promotion, and then, if the agent is not strictly honest, the contracts and agreements are so drawn that the owner is completely under the control of his agent. Usually the first step is to make an agreement stating on what terms the agent may control the property. Frequently the time limit is made as extended as the mine owner will allow, and the promoter goes to work or perhaps only appears to go to work to obtain subscriptions for the proposition. At any rate the expected contributions to the working fund are not obtained, but men are introduced who urge that if the mine were put in a company, then stock could be sold and money obtained, so after a time a company is formed and the property is transferred to it for shares, some of the shares are voted to the treasury, and a goodly proportion to the promoters, who now take more interest in the property, naturally, because they own a large share in it. Some money is obtained through the sale of shares, most of it

going to the promoters who sell their own stock. It is theirs, what law can prevent them from selling it? Some money is used on the property, enough to perhaps demonstrate to the promoters that it is a good thing, and then the whole proposition drags, money cannot be raised; the prospector must live, and presently he wants to sell some shares. Impossible, there is no market, the promoters have been unable to even sell the treasury stock. To remind them of their promises is of little use, what they said was what they expected to achieve, but for one reason or another conditions have not been favorable; after a time when the situation improves they will be able to carry out the arrangements; but the prospector wants money, so he finally sells a large block of his shares for a trifling price, and when he wants more money sells again; and presently all his stock is gone, and the mine he discovered is no longer his. Then he goes back to the mines cursing the promoters, damning corporations and swearing that stockholders are a set of sharks and thieves; but it is the promoters who have bought his shares for almost nothing, and now that they own all the property, or rather have it all under their control, with the majority owned by them and a good balance of stock in the treasury, they go

to work and develop the property, obtaining money by selling the shares; and most likely let the property fail two or three times, and by foreclosure or bankruptcy proceedings buy it in, and sell the shares of reorganized companies, repeating the operation, till finally the mine is on a working basis; and they who obtained the property from the discoverer, at forced sale, and by manipulation, and who have obtained money from several sets of stockholders to bring it to development, reap the benefit of their conspiracies, and own a fully developed mine.

The question may be asked why does the prospector have to do as the promoters or agents desire? Why does he not sell his shares directly to the investors? He cannot do so—investors will rarely listen to the man who owns the property and buy shares of him; and then he does not know how to organize, and naturally he seeks the promoter; and if promoters who may not be honest have obtained a hold on his property he must sell through them or not at all, for who would buy stock if those who have organized the company express doubts and rather talk against the proposition, and criticise the discoverer?

XVI

The Prospector, the Promoter, the Banker and the Investor, Correct and Dishonest Work Compared

Three against one is not a fair combination, yet the prospector, the promoter and the banker are frequently an adverse combination against the investor in mining stocks; and when the combination is formed for dishonest purposes the investor has a poorer chance because usually he trusts the banker. Probably the bankers are more to blame for losses in mining than are any other people. They are to blame, it is claimed by some people, for two reasons; it occasionally happens that they enter into unlawful combinations with the promoters to sell questionable shares to unsuspecting investors; and the other reason why the bankers frequently cause loss is that they will sneeringly dismiss the subject when a client asks advice in reference to a mining venture. The banker fails to obtain for himself participation in one of the greatest, if not the

greatest of our industries, and leaves his client without means of information, and an easy prey for the unscrupulous promoter. In regard to railway stocks, industrial stocks, municipal and corporate bonds the banker is well informed and seeks constantly to obtain information. In regard to mining he is densely ignorant, nor tries to better his information. The banker, occupying as he does a public position, neglects his duty when he makes no effort to serve intelligently such of the clients of his house who may become interested in mining propositions. He does them a double wrong by refusing to recognize in mining a great corporate industry because he retards their participation in this great industry, and by intelligent advice he could make advantageous investments for the clients of his house, where, by leaving to their own resources those who otherwise would seek his counsels, the way is left open for men who work by methods which at best are questionable.

An inquiry as to how bankers frequently take part with promoters will show many incidents of interest, and in some respects the bankers in the great financial centers are as gullible as the most innocent small tradesmen of a provincial town.

The promoter knows that to succeed he

must approach each victim on his most accessible side, and usually in dealing with a banking financial house he begins by opening an account for speculation in listed stocks. It may have been decided between the prospectors and promoters, that the property they represent should be offered in the great financial markets; to do this money is required, and frequently they have money, and after laying their plans it will happen some morning that a well appearing gentlemanly man calls at a New York banking house to make inquiries in regard to the stock market. The bankers are there for that purpose, and at once become interested in the pleasant stranger, and cordially invite him to call again. Of course, he calls again, this time with some money, and an account is opened. It proves a good account because the new client is there to seek favor and keeps his money active, taking small profits or losses, making several transactions a day and becomes a regular habitue of the place. Naturally the talk drifts to mining, and presently the bankers become interested in his stories; samples are shown, and the next thing a mine is offered through their house backed by one of their best customers, a shrewd successful man from the west. Then the game begins; the prospector, and others have

come on from the mining country are introduced; more money is put to the stock trading account, and the bankers have three or four active customers, who are in and out of the market, usually in quick turns, making about as much as they lose, or, if losing, the amounts are small, and the accounts can be kept active for a long time.

With such reputable backing as the bankers have given, with such shrewd, successful men operating the proposition, with such wonderful stories as are now circulated, the stock of the mining company this group of men represent begins to attract attention. The bankers buy some shares, many of their clients buy, people in the open market buy, the stock goes up, the greatest bonanza ever known has come out of the west, there is a scramble for shares, an active market for a time; the papers contain reports and interviews, all paid for, of course. What reporter ever wrote who would not make comments for a reasonable fee? Then comes a time when the miners must go back to see to the operations of their property. For a while the market keeps up, then begins to sag, the bankers send for information, but it is slow in coming; inquiries are sent to them from all about, and the stock goes lower; then comes a day when the bankers must reluctantly admit

that where they had taken the word of their pleasant, active customers, they find on investigation that the grossest exaggerations have been practiced on them, and they must confess that they have been taken in. Yet from time to time it is whispered about that not all bankers are taken in, some retain a share of the plunder, and make loud invectives against mining in general and the proposition in particular which lately they were backing; and when the discontent and criticism has subsided, they presently, that is some of them, become interested in another mine.

Not always are the bankers in friendly relation for profit with the mining promoters of questionable propositions; frequently they are genuinely stuck, and some are known to have refunded all the money which had been placed in a worthless enterprise through their misguided influence. It has been said that the wealthy brokerage houses doing a banking and stock business are the most easily taken in and caught by an exaggerated mining proposition, if only one or two active accounts are first introduced to make easy the presentation of the scheme. What is so respectable as an active account? Of course the mines coming from such a source are good; and the banker, densely ignorant of mining, though it is one

of our greatest industries, makes of himself an easy mark.. There are few honest mines offered in the great financial centers, the bankers are too sneeringly supercilious. Mining? They could not consider it. It is related that a man with an honest face and a pocket full of specimens stood once on the steps of a banking house and said under his breath: "Well, I'll be damned." He had a good proposition, one worthy of investigation, and had come east to find someone who would help him float it. He did not have money to open a fancy account, he was looking for someone who would take an interest in his proposition, and had been sneeringly turned down. Such had been his experience in a good many places. Finally he got in with some outside promoters and they floated the proposition. The papers. that is some of them, published attacks, criticising those who had taken the matter up, who, according to what the papers said, were fit subjects for criticism. Still the proposition grew, and found favor; and presently a great mining boom had developed. Nevada was brought to life again, treasure had been found; a real series of great mines had been discovered, a business running into hundreds of millions was being transacted; but among the greater bankers and brokers not the percent-

age represented by the fraction of a mill was transacted, the whole great business went to others. The bankers had not lived up to their public duty, they had no means and sought no information by which they could intelligently advise in regard to mining propositions; and there being no established places in which one could be advised, any proposition could be floated on the tide of excitement, resulting in the sale of questionable shares to the extent of millions of dollars; all, or the greater part of which at least, could probably have been saved had the bankers done the duty which their public positions would seem to require of them, and had taken the same care in regard to mining stocks which they take in regard to railway and other propositions.

If honest work were done the different transactions would be something like the following. A miner or prospector visiting a prominent banking house with a proposition would be heard and his claims given to a suitable person, perhaps an employe in charge of the mining interests, who would investigate, and finding the proposition questionable would so report to the house, but finding it desirable the business would probably be taken up, a mining engineer and an economic geologist would be called; and if they found it favorable, a

banking house of standing would presently be offering a desirable mining stock, and a reputable promoter retained by them would be pushing about and developing a market; then it would be that the prospector, the promoter and the banker would have been brought together on a proper basis to serve the investor. If such ever comes to be an established custom and investors will seek their bankers as the proper medium through which to obtain mining stocks, and if the bankers, not unmindful of their public duty, have at their command real advice from competent engineers, geologists and local representatives near the mines, a sort of utopian condition will develop in mining; and very few questionable propositions will be able to get through the offices of watchful banking houses, and reach the public to the disadvantage of those who may invest.

XVII

Mining Engineers of Divers Kinds. Some to Trust and Some to Avoid

It is the man behind the gun who wins the battle, and it is the man who overcomes the difficulties of operation who finally makes the mine a success.

A great mine owner once said: "It is easier to get a mine than a man. Give me a man and I will get the mine." There is much of truth in this saying, and many a good mine has been spoiled by poor management.

There are various kinds and varieties of mining engineers; there is the genuine article with suitable credentials, there is the man who has taken the profession up and sort of just worked into it, and there is the mining engineer who does his mining in barrooms and hotel corridors. These latter are the men who mostly get up schemes, and do as they would not be done by, which in modern slang can be expressed "Do the investors." Loud talking,

bragging, swaggering—these are the characteristics of the man who does his mining in barrooms and hotel corridors; when such are met avoid them.

Those mining engineers who have taken up the business and just sort of worked into it are generally known by their contempt for technical training, and their boasting approbation for practical mining. When dealing with such men be a little careful, they frequently graduate into the class who mine in barrooms; but some of them are eminently practical, well informed men, whose advice and guidance are often of the highest merit and value. In mining there is no school which can turn out such valuable men as the "School of Hard Experience." Only very few really graduate, because to become a well informed mining engineer, possessed of both knowledge and experience, one must have worked under varying conditions, and must have had the energy and strength to have spent long hours at study after an arduous day's work had been done. There are such mining engineers; usually they are not boastful, but their services are invaluable. The trouble with most mining engineers who have not had a regular course of technical training is that they have not done the studying to obtain the information which an engi-

neer should have, and as a consequence their work is superficial. A man who faithfully studies while working in the mines can, after about twenty years of effort, observation and study, consider himself a graduate of the "School of Hard Experience," and will have obtained all which the college boy will attain in his four years course, and a great deal more besides which the college graduate will probably never attain; and often the graduate in the school of experience may justly consider his attainments far above those of the ordinary technically trained mining engineer, but in the "School of Hard Experience" there are very few real graduates.

Then we have the regular graduated mining engineers, all of them exceptionally well informed men, most of them capable of intelligently applying what they know, and some few of them combining the technical training with real and varied experience; such men are the real leaders of the profession, and if any investor is so fortunate as to know such a man, let him be wise, and keep putting money into the mining propositions his friend may advise, and the chances are he will become rich.

Besides these there are the practical miners, men who have devoted lives to work in the mines, many of them with good hard sense,

but informed in too limited a scale to be safe guides in relation to mining investments; often they make the most excellent mining superintendents and managers, but just as often they undertake works of developement, and follow flights of ambitious fancy into realms which they do not understand; then they make heavy losses, and bring disaster to the enterprise which has been intrusted to them.

When a mine is put in operation some one or another of these different classes of mining engineers is probably in charge, excepting only the engineers who do their mining in bar-rooms and hotel corridors. Such men usually never see a mine, or if they do, it is a superficial examination only, a visit, an outing, drinking and big talk—a grand time; but very little practical consideration of the mine.

XVIII

The Gist of the Whole Matter

Does one want to become rich—one can become rich through intelligent investments in mining stocks, but not without working. Investigate—that is the gist of the whole matter. One may make some money by a lucky stroke in a mining risk, but if one is lucky one does not need to be rich, and then very few people are lucky, most have to work for what they obtain; and to obtain good results in mining propositions the work required is that one should investigate, and do it for one's self, not depending on others. We have read of a great many things and conditions relating to mining, from such reading one should know along what lines to investigate; and if one does the work, makes real personal investigations, and puts together the independent testimony received from different sources, and then uses good judgment; remembering that nothing is sure in mining, that it is a speculation, not an investment; that even with the best care losses must be expected, and that the money is placed

for a great winning or a total loss, because there is no middle ground, if the mine doesn't pay it is a total loss, but if it does pay it is a tremendous profit. One can afford to lose something where such great profits are had, but if one just buys mining stocks on the recommendation of others, and takes the chances, the chances are that one will lose with disheartening regularity; but if one will do the work, and really investigate, one will make money a great many times, and this is the gist of the whole matter. A great many minor points must be examined, but principally one must know three things: first, that the parties soliciting the use of his money have got a good thing; second, that they have the ability to obtain good results out of a good thing and, third, getting such results that they are honest enough to give him his just proportion of what they obtain.

XIX

A Financial Plan Which Should Lead to Success in Mining

In concluding this work I desire to present an outline of a proposition which, if a mining promoter were willing to accept, it could be taken as assurance that he meant to do what was right. It is probable that few mining promoters would accept such a proposition, still it might be well for those who think of investing in mining stocks to have the proposition before them to use as a test in replying to mining solicitations for capital. If a man soliciting money would accept a plan as follows it would be a very good indication in his favor.

First: Show reports and recommendations of competent engineers, or experienced mine operators; with specifications of the money required to make the mine successful.

Second: Prove that the specifications are correct by offers from responsible mining contractors to do the work specified for the

amount named by the engineer, or experienced mine operator.

Third: Solicit money from investors to provide for the work required on a subscription basis only, the subscriptions payable to a trust company or individual trustee, and to be available for the use of the mine when the amount required has been fully subscribed. If the amount required is not obtained, money to be returned to subscribers.

Fourth: On sufficient funds being subscribed, let the trustee apply the same to payments for carrying out the requirements as specified by the engineer, or experienced mine operator. No money to be paid over for the use of promoters.

Fifth: When the work is completed, with the mine equipped and opened, let the property be turned over by the trustee to a board of directors elected by the actual subscribers who have paid their money.

On this basis mining will pay the investor, and selling mining stocks for the benefit of promoters will not be possible, yet mine owners and promoters can fully share in the legitimate profits obtained from a mine.

APPENDIX

How to Calculate the Values of Mining Stocks*

No investments present such vicissitudes of fortune as mining ventures. There is scarcely a man in our country who has not at one time or another purchased mining shares in the hope that he might secure an investment comparable to those glittering examples of success so industriously advertised by the promoter. Yet mining is a good business, and it is desirable that investors should purchase mining stocks.

It is difficult for those not informed in regard to the technicalities of mining to exercise good judgment as to what they should and what they should not purchase, and, unfortunately, very few are sufficiently informed to know even what points should be examined, and what questions asked, in order to form an opinion on mining investments.

The following statements, calculations and tables represent an effort to bring together material which may be a guide to the proper understanding of the risks and opportunities in mining ventures.

Certain facts, given below, should be borne in mind when considering this class of investment.

1. There is no middle ground in a mining investment; it is either a total loss or a profit. In other enterprises a reduced rate of interest or even losses may be recovered later by better business; but if mine does not pay it is a total loss.

* Reprinted by permission of the Mining World from a series of articles by Dr. Nicholas published in that journal.

2. There is no mine so great it cannot be exhausted, consequently, all mines must be worked out in time, and each ton of mineral taken out brings the property one ton nearer to the point where all the mineral will be exhausted, leaving an empty shell of stopes and shafts from which no further returns can be expected.

3. The all important question is not the dividends a mine may be paying, but the quantity of mineral remaining underground from which dividends can be earned.

4. Mining, because of the possibility of rapid changes from nothing to discoveries resulting in enormous wealth, becomes an absorbing passion. Hence the miner frequently loses his judgment in his hopes like the gambler expectant of good fortune.

5. When enthusiastic statements are made about a property to encourage investments one should not be skeptical of the miner's honesty, but should make careful inquiry and consult the tables herewith presented for estimating the average risk, then, if the results seem favorable, the investment may be considered.

The following inquiries should be made before purchasing any mining stocks, no matter how alluring the prospectus.

1. Does the company actually own its property? This can be learned by examining the record of the company's titles.

2. Are there any debts? This can generally be learned from the reports made by the company's officers, because if they make false statements they become crimnially liable.

3. Has the mine been examined by a competent mining engineer, or economic geologist? Inquiries should be made as to where the person writing the report pursued his studies, what practical experience he has had and what recognition has been given his work by technical institutions.

4. Do the people who are interested in the company understand mining as a business? This can be learned by making inquiries among people associated with reputable mining companies, and from the references presented by the parties interested.

5. Are the people managing the company worthy of confidence? For this information consult their references, and the mercantile agencies.

If, after making the inquiries outlined above, it is found that the company does not actually own but proposes to acquire a property it may have under contract (option); or that debts are accumulating, or that the report recommending the property is made by a person of inferior attainments; or that the people interested in raising the money are simply brokers or promoters and not men of practical experience in mining proper; or if the management of the company is not worthy of confidence, then the proposed investment should be most cautiously considered and accepted only on evidence of very strong counterbalancing advantages.

If, however, the inquiries made are answered satisfactorily, the investment may be considered with favor, but it will always be subject to the chances of fortune common to all mining operations. What the chances of fortune are may be approximately estimated by using the tables herewith.

Mining stocks are valued only by the dividends they will pay. These payments can be maintained

only so long as valuable mineral is mined, after which the stock of the company is worthless. Therefore, the cash value of a mining stock should be the present worth of prospective dividends. The chance of not receiving the dividends is always threatening, but there is also in every mine some opportunity for rich discoveries which will result in a higher rate of dividend; these two elements of risk in some measure balance each other. While the present worth of prospective dividends is a fair basis on which to calculate the value of a mining investment this alone is not sufficient; one must be a keen judge of future prospects, and be well enough informed to know how much valuable mineral may remain in the mine, because from this "reserve" only can dividends be paid.

The life of a mine, that is the period during which it can pay dividends, is variable. There are a few famous mines which are apparently inexhaustibly supplied with ore, but such mines are rare. Since the life of most mines is limited a cautious investor in figuring a present worth for prospective dividends should make his calculations on a short dividend paying period, except when considering well established mines with substantial ore reserves.

Following is a table of mining values, without interest, based on 20 per cent. dividends, the amount invested being $100.

Year	Dividends received	Loss if mine fails
First	$ 20	80%
Second	40	60%
Third	60	40%
Fourth	80	20%
Fifth	100	Nil, except interest

Should the mine continue to pay after five years the values then remaining are clear profit. In this

simple table, however, interest is not taken into account. A comparison may be made between $100 invested at 6 per cent., and $100 invested in mines at 20 per cent., crediting the 6 per cent. each year to the secured investment, and deducting the 6 per cent. each year from the mining investment. Remember that 20 per cent. return on a dangerous investment is not 20 per cent. net profit, since the money would produce 6 per cent. on a better security; the real profit is the difference, or 14 per cent. annually.

The following table shows the value of mining investments as compared with investments whose principal is secured. Mining investments to pay 20 per cent., secured principal to pay 6 per cent. per annum. Amount invested $100 in each case:

$100 on Good Security			$100 in Mining Stocks		
Year	Int. 6%	Amt.	Year	Divi-dend, 20%	If mine fails
First	$ 6	$106	First	$ 20	86% loss
Second	12	112	Second	40	72% loss
Third	18	118	Third	60	58% loss
Fourth	24	124	Fourth	80	44% loss
Fifth	30	130	Fifth	100	30% loss
Sixth	36	136	Sixth	120	16% loss
Seventh	42	142	Seventh	140	2% loss
Eighth	48	148	Eighth	160	*$12 profit
Ninth	54	154	Ninth	180	† 26 profit
Tenth	60	160	Tenth	200	‡ 40 profit

* Equal to 1½% per annum for the eight years.
† Equal to 2.88% per annum tor the nine years.
‡ Equal to 4% per annum for the ten vears.

At the end of the tenth year it is apparent that a mine paying 20 per cent. in dividends per annum has returned the principal and 100 per cent., but it is not so readily understood that this 100 per cent. cannot be considered as net profit. The same money on reasonable security would have produced $60, and if at the end of the ten years the mine is exhausted

the returns will be $100 principal, $60.00 interest and $40.00 profit, the mine produced $200, and the real profit in ten years is $40, equivalent to 4 per cent. net profit per annum after deducting principal and interest. If at the end of ten years the mine is exhausted the profit has been only 4 per cent., but should it continue to pay the profit is larger. From the tabulated results the conclusion is reached that, after allowing for principal and interest, if the mine pays 20 per cent. for eight years, there is a slight profit; if for ten years, it is a fair profit, and if it pay 20 per cent. more than ten years there is a very good profit.

Ten years, however, may be regarded a rather long average for the life of most mines, but with a dividend of 20 per cent. the money invested is returned in five years, at the end of which period the loss, if the mine fails, is simply the interest. A fair calculation in determining the value of a mining share is five years' dividends estimated at the rate the mine may be paying. If the mine were well established the time for calculating the value of its shares might be extended to ten years, but if the shares were purchased on such a valuation the investor would require ten years' continuous dividends before his money could be returned without interest, and this is a rather slow proposition.

In some great mines where large ore reserves, sufficient for many years' working, have been proved up, the shares become a business proposition, and their value can be safely estimated according to the worth of the ore in sight and the cost of mining and milling it; but for ordinary mines the tables above will be found serviceable in estimating stock values.

If the values of mining shares are calculated at compound interest the results will be much more favorable to the investment, but as there is always a risk that the mine may fail, compound interest valuations cannot be considered equitable, excepting that a deduction is made to allow for this risk, this deduction bringing the computation to about the basis of simple interest; therefore a compound interest calculation should be considered only as an interesting tabulation of values to be obtained if the mine continues paying for a long term of years.

The table below shows the returns from mining shares paying 20 per cent. per annum (dividends reinvested in the same mine at the same rate annually) as compared with money at 6 per cent. compound interest on good security. Amount invested in each case is $100.

Year	Interest 6%	Amount
First	$6.00	$106.00
Second	12.36	112.36
Third	19.10	119.10
Fourth	26.25	126.25
Fifth	33.83	133.83
Sixth	41.86	141.86
Seventh	50.37	150.37
Eighth	39.39	159.39
Ninth	68.95	168.95
Tenth	79.09	179.09

Year	Dividend 20%, reinvested	
First	$20.00	86% principal remaining at risk
Second	44.00	69.36% principal remaining at risk
Third	72.80	46.30% principal remaining at risk
Fourth	107.36	18.89% principal remaining at risk
Fifth	148.83	15% Gain, 3% per annum
Sixth	198.60	56.74% Gain, 9.46% per annum
Seventh	258.32	107.95% Gain, 15.42% per annum
Eighth	329.98	170.59% Gain, 21.32% per annum
Ninth	415.98	247.03% Gain, 27.44% per annum
Tenth	519.18	340.09% Gain, 34.01% per annum

From these tables, calculating the value of mining shares, one at simple, the other at compound, interest, it is evident that a mine paying 20 per cent.

annually for ten years and then failing would have returned at simple interest an amount equal to 4 per cent. per annum profit above the return from a secured investment paying 6 per cent. A simple interest investment account is one where the income is used and produces nothing more for the person receiving it. Where the dividends are reinvested (which unfortunately is not frequent), the investment account can be considered on a compound interest basis, and at the end of the tenth year will have shown earnings equal to 34.01 per cent. per annum above the highest ordinary rate of 6 per cent. per annum. This calculation is theoretical, for if at the end of ten years, or at any previous time, the mine became exhausted, all the money invested would be lost, though the investor had received an amount equal to 34 per cent. more than the 6 per cent. rate per annum. Here the act of investment, not the calculation, would be at fault.

This condition emphasizes the importance of the question, How far is it safe, or speculatively desirable, to invest in the shares of an old mine which has paid dividends for any considerable period?

As an average proposition to invest on the basis of a cash price equal to five years' dividends seems reasonable, the probabilities of receiving one's money again are fair and it is also likely that at the end of five years the stock will still be worth something, perhaps nearly as much as the original investment, thus making mining investments attractive to those who understand them. As a matter of fact, however, the mine in which an investment has been made must at some time become exhausted, suggesting that mining stocks should never be considered as permanent investments. It is for this reason

that conditions relating to the future of a mining property should be carefully studied.

An Inquiry in Relation to the Prospective Values in an Old Dividend Paying Mine.

It is usual that stocks in old established mines sell above their worth because the claim for almost unlimited mineral deposits is more easily maintained in the case of a large producer than for a property that has yet to make its reputation; though it may be that the large producer is rapidly approaching the time when, its mineral deposits becoming exhausted, it will be of no further value. There are, as previously stated, famous mines with apparently an almost unlimited quantity of mineral to draw from, but these properties are few in number, while unfortunately many mines once famous are now abandoned, or they are struggling along in hopes of uncovering new mineral bodies. A mine at the height of its greatest prosperity may be in rapid approach to its point of final exhaustion. In view of these conditions the following points should be considered in estimating the value of stocks in an established mine.

First—Calculate the value of the whole mine as represented by the price of its shares. To ascertain this, multiply the price of one share by the total number of shares. Is the mine worth that much?

Second—In all established mines a portion of the value is, or ought to be, secured by mineral in sight. Take the estimated value of the mineral in sight, less mining and milling charges, and divide it by the number of shares in the whole mine; this will

show what proportion of assured value there is for each share, and this assured value can be compared with the price of the shares to ascertain how much of that price is for assured values, and how much for prospective values.

In estimating the ore in sight, and in estimating the assured value of a property's shares an allowance should be made for the risks in taking the mineral out, and the dangers attending mining. Inquiry should also be made as to whether the mineral in sight is blocked out and measured, or whether it is in sight simply by estimates from surrounding conditions; in the latter case a considerable reduction should be made to allow for the risks of errors in estimating mineral in sight without actually measuring it.

Third—Treat the unseen portions of the mine from precisely the same point of view as one would in considering an undeveloped property. In an established mine great returns are always expected from its undeveloped ground because of its past record, and for this there is frequently good reason but the undeveloped ground has not been seen, all unseen ground is a risk, and the future of dividend paying mines in relation to their undeveloped ground is a risk, on the same basis that any unseen ground or prospect is a risk. In a dividend paying mine, however, one has more data to estimate what the risk really is. In estimating the chances for a future profit beyond the value of the mineral in sight treat all the unseen ground as a prospect and be guided accordingly.

Misapprehension is frequently by reason of the high par value that is often placed on mining shares. In the other extreme the true position of a share-

holder is frequently obscured because of the issue of a great number of shares at a low par value.

Under the laws of many states mining stock can be issued in excessive amounts full paid in consideration of a mine transferred to a company in exchange for its stock. The way is open for excessive capitalization, and this is frequent. In considering the offer of a $1 share for five cents, or a $10 share for 50 cents, or a $50 share for $2.50, the par value should be entirely disregarded. The par value of the shares is not the point an investor should consider; the real question is, How many shares are there? If there are 100,000 shares selling at 50 cents each, the whole mine is selling on the basis of $50,000, and the owner of one share holds 1-100,000 of that property. If in the same mine there are 1,000,000 shares selling at 5 cents each, the property is marketed on the basis of $50,000; but the holder of one share has only 1-1,000,000 of the whole property; and it matters not whether a share has a par value of $1 or $1,000, the owner will be entitled to his pro rata of the value of the ore taken out of the mine after deducting expenses, and nothing more.

Table for Determining Approximately the Proportionate Risk in a Mining Investment.

Table of assured values for mineral in sight, and the proportionate risk for unseen ground:

The mineral in sight represents of the amount invested.	For the unseen ground. The risk is for the total amount invested.
100%	0%
95	5
90	10
85	15
80	20
75	25

The mineral in sight represents of the amount invested.	For the unseen ground. The risk is for the total amount invested.
70	30
65	35
60	40
55	45
50	50
45	55
40	60
35	65
30	70
25	75
20	80
15	85
10	90
5	95
0	100

To ascertain the approximate chance of obtaining a profit for the risk taken use the following table as directed.

The table is arranged in ten columns, each column representing one of the conditions because of which the vicissitudes of mining investments usually arise. Through the columns ten spaces are ruled, and in each space a grade of condition is noted from the very best conditions that could be found placed at the top of the column and rated as ten; that is, ten chances in ten, or a certainty, of a profitable investment; to the poorest conditions from which any possible returns could be had, placed in the next to the last line of spaces, and rated as 1 and representing only one chance in ten of a profitable investment. The spaces are rated as 10 down to 1 and a line of spaces rated as 0 is added to the table to represent the conditions under which it is impossible that profits could be made from a mining investment.

The cost of mining and delivering the mineral is a risk, and in the maintenance of the engineering on an efficient basis there is a slight risk; these can

generally be calculated and are therefore not tabulated.

There is some risk because of unskilled or dishonest management, but American laws provide the means by which an investor can protect himself in such matters; and as a general proposition this risk can be allowed for by deducting one-half to one chance in ten from the results found by using the table.

Before proceeding to an examination of the table it may be well to consider briefly what an element of chance really represents.

Among the tabulated classifications even chances are represented by five. A familiar example of even chances is matching pennies, the chances are exactly equal; and it is a remarkable fact that if some thousands of pennies are matched it will be found that they are almost equally divided. An investor putting money in a mine where the chances are equal has the same opportunity to make a profit as if he were matching pennies. If the chances are as four in ten, or one less than even, he takes the same risk as he would when matching pennies under an obligation to give away one out of every five he secured; if the chances were as three in ten it is as if two out of every five secured were given away, and so on through all the table. Where the rate is better than even chances the relation can be explained by supposing additions to the winnings in the same proportion as stated for reductions from the winnings where the risks are rated below even chances.

No man can be infallible in judging and estimating unseen ground, and mines considered absolutely worthless have returned remarkable profits, while

mines reported on as the best by competent authorities have later proved disastrous failures; but such instances are extremely rare, and should not be considered by a careful investor.

In writing of mining risks and chances as compared with matching pennies a more accurate basis might be the comparison as above stated with the chance added that a great prize might be had with one or more of the pennies secured; such a chance certainly exists in mining, and is the reason why almost every bit of mineral found, even though the surroundings are unfavorable, is prospected and generally opened to a considerable extent under a dead loss because of hopes that it may lead to a valuable deposit.

Explanations For Using the Table.

First—Ascertain the assured value from a calculation or estimate of the value of the mineral in sight; deduct from this a reasonable sum for the risk and expense of mining, milling and maintenance as the circumstances may require. The result will be an estimate of the assured values which may be credited to the mine, and which divided by the number of shares will give the assured value per share. If the assured values indicate a profit on the amount invested it is a business proposition to which the investor may add the chances for a further profit as may be indicated by an estimate of the value of the unseen ground as shown in the table. If, however, the pro rata of assured values per share do not equal the price at which the stock is offered, the difference is at risk.

Second—After estimating the assured values let

all the balance of the proposed investment be for unseen ground and taken as a risk. Estimate the chances in this risk by considering each column of conditions in the larger table and check in each column the division which most nearly represents the conditions at the mine. Add together the values tabulated for each division which may have been checked, and divide by ten, the result will be approximately the average chances in ten for a profitable investment under the conditions surrounding the property which may be under consideration.

To allow for the risk of loss because of unskilled or dishonest management subtract one-half to one or even more from the results obtained as the case may require.

Third—If the mine is simply a prospect proceed in the same manner, but without allowing for assured values because of mineral in sight.

Fourth—Wherever a zero condition is found indicating circumstances under which it would be an impossibility that any returns could be had do not make an average of chances, because one zero condition could not be compensated by other conditions, however favorable, and where a zero condition is found for a property which may be under consideration that property should be rejected.

I.

Amount of Ore and Associated minerals in Sight.

10. Assured.
    Unusually extensive.
9. Superior.
    Extensive.

8. Very good.
   Large.
7. Good.
   Above average.
6. Fair.
   Rather good.
5. Passable.
   Fair average.
4. Poor.
   Rather inferior.
3. Very poor.
   Inferior.
2. Bad.
   Small.
1. Very bad.
   Very small.
0. Outclassed.
   Tiny bits of no importance.

II.

Condition and Extent of Walls, Roofs, Floors or Outcropping.

10. Assured.
    Unusually regular and extensive. Unmistakable evidence of continuity and permanence.
9. Superior.
   Regular and extensive, good evidences of continuity and permanence.
8. Very good.
   Fairly regular, fairly extensive, with some evidences of continuity and permanence.
7. Good.
   Slightly irregular, fairly extensive, not against probable continuity and permanence.

6. Fair.
   Irregular, fairly extensive, continuity and permanence not indicated, but reasonably in expectation.
5. Passable.
   Irregular, not extensive. Continuity and permanence somewhat doubtful.
4. Poor.
   Decidedly irregular, not extensive, continuity and permanence doubtful.
3. Very poor.
   Broken and irregular, rather small, evidences rather against continuity and permanence.
2. Bad.
   Broken, very irregular and small. Evidences against continuity and permanence.
1. Very bad.
   Very irregular and very small. Evidences decidedly against continuity and permanence.
0. Outclassed.
   Continuity and permanence demonstrably impossible.

III.

Chemical and Physical Conditions of Surrounding Formation in Relation to the Mineral Found.

10. Assured.
    Unusually favorable. Very regular. Broadly continuous, demonstrating depth or extent.
9. Superior.
   Favorable, regular, continuous. Promising depth or extent.

8. Very good.
   Neither favorable nor unfavorable. Regular, continuous, promising depth or extent.

7. Good.
   Favorable but irregular. Possible change to unfavorable.

6. Fair.
   Favorable but irregular, broken. Might change to unfavorable. Some indications of faults.

5. Passable.
   Neither favorable nor unfavorable. Irregular broken. May become unfavorable. Some faults indicated.

4. Poor.
   Chemically unfavorable to mineral found, but very regular, promising depth or broad extent of formation.

3. Very poor.
   Chemically favorable, but very irregular. Badly broken, serious faults indicated.

2. Bad.
   Neither favorable nor unfavorable. Very irregular, badly broken. Serious faults indicated.

1. Very bad.
   Unfavorable, very irregular, badly broken. Serious faults clearly indicated.

0. Outclassed.
   Under which the mineral found could not exist in merchantable quantities.

IV.

Extent and Distribution of Mineralization Within the Deposit.

10. Assured.
    Unusually regular, even and continuous; demonstrating permanent, very extensive numeralization.
9. Superior.
    Regular, continuous, promising permanent extensive mineralization.
8. Very good.
    Continuous, not entirely regular, slight doubts as to permanent extensive mineralization.
7. Good.
    Continuous, somewhat irregular, some portions might be unprofitable.
6. Fair.
    Continuous but uneven. Indications that some portions would not be profitable.
5. Passable.
    Not entirely continuous, uneven. Indications of some unprofitable zones.
4. Poor.
    Not continuous, decidedly uneven. Indications of unprofitable zones.
3. Very poor.
    Distribution so irregular, workable only by sorting, unprofitable zones.
2. Bad.
    Very irregular, spotty. Much dead work to obtain any good material.

1. Very bad.
   Spots only. Doubts of sufficient good material to compensate working.
0. Outclassed.
   Mineralization in small isolated spots where demonstrably no profit could be made.

V.

Value of Mineral Found.

10. Assured.
    Better than the highest commercial grades. Profits amply secure beyond possible fluctuations.
9. Superior.
   A high commercial grade, margin of profit commercially sure.
8. Very good.
   Commercial grade of fine. Profits secure except during great depression.
7. Good.
   Commercial grade good, margin of profit secure under ordinary conditions.
6. Fair.
   Commercial grade fair, margin of profit subject to market fluctuations.
5. Passable.
   Commercial grade salable. With favorable market fair margin of profit.
4. Poor.
   Sufficient to pay expenses but no profit.
3. Very poor.
   A loss but not over 33 1-3 per cent. Worked in hopes of better development.

2. Bad.
   A loss but not over 50 per cent. Worked in hopes of better development.
1. Very bad.
   Loss more than 66 2-3 per cent. Worked on speculation for better developments.
0. Outclassed.
   So low that no profit would be possible.

VI.

Composition of Mineral and its Facilities for Treatment.

10. Assured.
    Unusually favorable yielding finest results by simplest treatment.
9. Superior.
   Favorable, yielding satisfactory returns by ordinary treatment.
8. Very good.
   Generally favorable. Results a little below expectations by ordinary treatment.
7. Good.
   Slightly complex. Results fairly profitable; not entirely satisfactory by ordinary treatment.
6. Fair.
   Complex, some profit by ordinary treatment.
5. Passable.
   Complex. Irregular. A profit by ordinary treatment after careful sorting.
4. Poor.
   Complex, undesirable constituents. Requires special treatment before profits can be expected.

3. Very poor.
   Complex, irregular. Undesirable constituents make results somewhat doubtful.
2. Bad.
   Complex, irregular, undesirable constituents abundant, grave doubt of successful treatment.
1. Very bad.
   Undesirable constituents and conditions very prevalent, profits only if successful treatment can be found.
0. Outclassed.
   Of such character that no profit could be made by any known method.

VII.

Natural Supplies Water, Timber, Labor, Etc.

10. Assured.
    Assuredly abundant at all times at a minimum cost.
9. Superior.
   Abundant, easy to obtain, and at a low cost.
8. Very good.
   Sufficient, not difficult to obtain at ordinary cost.
7. Good.
   Sufficient for ordinary needs during a reasonable time. Cost rather above average.
6. Fair.
   Sufficient with careful management. Cost above average.
5. Passable.
   Rather inferior amounts. Cost decidedly above average.

4. Poor.
   Inferior, and at a cost to rather tax operations.
3. Very poor.
   Scarce, cost heavy, a serious tax on operations.
2. Bad.
   Deficient, cost a tax on operations sufficient to jeopardize results.
1. Very bad.
   Very deficient. Cost very excessive making profits seriously doubtful.
0. Outclassed.
   So poor and at such cost that no profits would be possible.

VIII.

Topographical and Physical Conditions. Dangers From Excessive Water, Collapses, Poisonous Gases, Etc.

10. Assured.
    Every facility for mining at a minimum cost unusual security against dangers.
9. Superior.
   Facilities for mining at a low cost. No dangerous conditions indicated.
8. Very good.
   No special difficulty or impediment in mining. The ordinary dangers only.
7. Good.
   Slight difficulties to overcome and consequent dangers a little above the average.

6. Fair.
   Engineering difficulties and dangers beyond the average, but not at all unsurmountable.
5. Passable.
   Special engineering to overcome difficulties and danger before deposits are available.
4. Poor.
   Available if special engineering overcomes difficulties and dangers. Results somewhat doubtful.
3. Very poor.
   Probably available if special engineering overcomes difficulties and dangers. Results doubtful.
2. Bad.
   Questionably available provided special engineering overcomes difficulties and dangers. Chances against successful engineering.
1. Very bad.
   Possibly available if special engineering overcomes difficulties and dangers, but these so formidable that results are very doubtful.
0. Outclassed.
   Engineering dangers, and difficulties which demonstrably could not be overcome.

IX.

Political Conditions.

10. Assured.
    Absolute security under good laws and peaceful tenure of occupancy.

9. Superior.
   Good security, good laws, peaceful occupancy; only the ordinary disturbances of mining camps.
8. Very good.
   Good laws to back enterprise, but some dangerous conditions in local surroundings.
7. Good.
   Laws, judiciary and public order not entirely secure, nor yet seriously dangerous.
6. Fair.
   Such that enterprise must depend somewhat on its own strength for security.
5. Passable.
   Such that enterprise must look well to its own strength for security.
4. Poor.
   Beyond the protection of law, but dangers not very seriously threatening.
3. Very poor.
   Beyond the protection of law, threatening dangers require strength to protect interests.
2. Bad.
   Must expect aggression from surrounding dangers, and dishonest officials.
1. Very bad.
   Grave dangers causing doubts as to maintenance of enterprise under such surroundings.
0. Outclassed.
   Dangers and complications so great that no enterprise could be maintained.

X.

Accessibility.

10. Assured.
    Every advantage, lowest grade mineral salable. General supplies at less than ordinary quotations.

9. Superior.
    Without difficulties, all but lowest grade mineral salable, supplies at current quotations.

8. Very good.
    Without difficulties. Distance prevents sale of lower grade minerals. Supplies rather expensive.

7. Good.
    Requiring expenditure of capital before any but selected grades salable. Supplies expensive.

6. Fair.
    Requiring expenditures before any but highest grade ores could be sold.

5. Passable.
    So situated that no ore could be sold. Works required for milling or smelting.

4. Poor.
    Requiring works for treatment with some danger that machinery cannot be delivered on the property.

3. Very poor.
    Danger of non-successful delivery of machinery on the property such as require careful consideration.

2. Bad.
   Distances and difficulties are such that successful establishment of machinery is doubtful.
1. Very bad.
   Such that successful establishment of works to utilize mineral is extremely doubtful.
0. Outclassed.
   Inaccessible, where mineral found could not possibly compensate for machinery and improvements.

Mining Risks Compared With Gambling Hazards.

Having considered the advantages and disadvantages of a mining venture, and decided whether one should or not take the risk, the fact that money so used is at hazard, put out for a great winning or a total loss, should be fully realized. Mining risks are to some extent similar to gambling chances, with the difference that the chances of winning from the mines are much more favorable, and furthermore, mining is legitimate and honorable, where one success brings prosperity and employment to thousands and returns profits sufficient to compensate for numerous losses. It must be remembered that great returns in mining result principally from cheap stocks in undeveloped properties or from exploration schemes, provided they are honestly conducted. In such ventures, however, the money is at stake for a great return or a total loss; hence speculative mining stocks bear some resemblance to lottery tickets.

The chances in mining are good, the chances in a lottery are almost nil; yet it is a remarkable fact

that were the sale of lottery tickets permitted they would be purchased at par to the value of millions of dollars monthly; while mining stocks offering a better chance for a great winning, as will be shown by the following calculations, are difficult to sell even at a big discount.

Chances by Lottery.

Scheme of the lottery as usually presented by the Spanish-American lotteries. All others have been suppressed in America.

Usually 1,000,000 tickets of $1 each are authorized, although there is little mention of the number of tickets. The prizes are put forward with great prominence. Based on one million tickets a tabulation of the chances would give results as follows:

		Chances of Winning
Grand prize	$30,000	1 in 1,000,000
10 prizes of	1,000	1 in 100,000
20 prizes of	500	1 in 50,000
50 prizes of	100	1 in 20,000
500 prizes of	10	1 in 2,000
1,000 prizes of	2	1 in 1,000
3,000 prizes of	1	1 in 333⅓
4,581 prizes.	Chances of winning	1 in 218.2

The chance of winning the capital prize, one in 1,000,000, is so remote that it is practically no chance at all, and the chances of winning $1,000 for $1, one in 100,000, are scarcely worth considering; while the chance of getting your money back with perhaps a prize, one in 218, is so bad that it is not worthy of serious consideration. If mining stocks were offered on a similar basis they would be simply laughed at, yet lottery tickets are eagerly purchased at par, many very intelligent people taking a chance on them. It is quite possible for a mining stock in a

legitimate enterprise not overcapitalized to pay $30,000 for each $1 invested, and the chances of winning are better than getting the capital price in a lottery: more than this, the chances for substantial returns from a mining venture are much better than a lottery. These facts are logically indicated by the following statements and estimates:

It can be claimed in reason and as self evident that there are not, and have not been, 1,000,000 mining enterprises in North and South America combined, and if it can be shown that one mine out of them all has returned $30,000 for one, then the chances of receiving such a return are better than one in a million.

The Callao mine in Venezuela formerly had a great record, though at one time the stock went down to a few cents a share. The mine was to be abandoned, but one of the men believed in it, bought stock at a few cents a share and worked the property himself. He subsequently uncovered the fabulous gold deposits, since worked out, but which once made the mine so famous that a single share was reported to be valued at $53,000. I knew this gentleman. Although he lost heavily in following the decline of the stock, expecting new deposits to be uncovered, at his death, not long since, his estate was appraised at $15,000,000, all made out of the Callao mine.

The Alvorado mine, in Mexico, shows how a poor peon became a multimillionaire in a few months.

Comparing the chances for moderate winnings, who is there owing a fortune to luck in lottery tickets, yet how many thousands have made fortunes in mining! This is demonstration that where legitimately conducted the chances of a winning are

very favorable to the mining venture and very unfavorable to the lottery ticket.

In a lottery the chances of getting you the money back with perhaps a premium are as one in 218; on the same basis, a chance in 218 mines, the average result would be that only one would pay. No one would consider such a risk, yet this is precisely the proportionate average to be expected in purchasing 218 tickets in the lottery schemes used as an illustration. It seems strange that the public is so often prejudiced against putting money in mining ventures even to a moderate extent. Those who have mining stocks to sell, or seek to organize private mining ventures, are much to blame for the development of this feeling, because they have invariably compared mining stocks to investments. Mining stocks should not be considered as investments, for when compared they make a poor showing; an investment presupposes security, and a mining stock is a speculation.

To interest people in mines explain the element of risk compared with the chances for a profit and let people know what they are buying. A mine cannot be considered on an investment basis till the ore bodies are proven and the profitable treatment of the ore has been accomplished. Stocks in mines representing these conditions sell so high that the chances for great winnings are very much reduced because the winning has been made, and naturally it accrued to those who bought while the mine was an untried venture, as all mines are at their opening.

Proceed with caution in considering mining ventures, and try your luck in legitimate enterprises, risking only what can easily be afforded at hazard. Before staking any money, however, investigate,

and remember always that an undeveloped mine is not an investment but a hazard for a great winning or a total loss. Mining is a risk, however, in which science, skill and experience can be intelligently applied to great benefit; and under such guidance the chances for a profit are favorable to the speculation. Mining is a speculation, but it is legitimate and honorable, and can result in unusual profits to compensate for the risk. Wherever a mine becomes a success it brings prosperity, happiness and steady employment to many people, and one such winning can compensate for many losses.

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The Portland Cement Industry From a Financial Standpoint

By EDWIN C. ECKEL,

Author of "Cements, Limes and Plasters," and until recently in charge of the cement work of the United States Geological Survey.

The only book which shows the possibilities and pitfalls of investments in the securities of cement producing concerns. Invaluable to the banker who is invited to aid in the flotation of cement securities and to the investor who is invited to buy them.

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